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ARCHIVES OF PEDIATRICS:

A MONTHLY JOURNAL DEVOTED TO THE DISEASES OF

INFANTS AND YOUNG CHILDREN.

EDITED BY

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THE
ARCHIVES OF PEDIATRICS.

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[No. 1.

Original Communications.

THERAPEUTICS OF INFANCY AND CHILD-
HOOD.

BY A. JACOBI, M.D.,

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(Continued from December Number.)

V.—INFECTIOUS DISEASES.

3. *Cholera.*

THE form of acute gastro-enteritis which has been described under the head of "cholera morbus" when met with in the adult, and attracted intense attention a few years ago when Finkler and Prior discovered their comma-bacillus, resembling in most points that of Asiatic cholera as found by Koch, is a frequent occurrence among infants and young children. They are attacked during the summer months or in hot rooms, where milk will be readily decomposed, and when artificial food of doubtful quality and improper composition is administered. Many of these cases must not be claimed as infectious, for their alleged epidemic character need not be anything but the occurrence of the same affection in the many who are exposed to the same unwholesome influences.

Among the many microbes met with in the intestines of

infants thus affected, no specific bacillus has been discovered. It is true that we meet, occasionally, with reports of cases of intestinal mycosis exhibiting bacilli, resembling those of anthrax, in the contents, epithelia, and submucous tissue of the intestinal tract, and also in the chyle-ducts and the lymph-bodies, but both the symptomatology and the pathological anatomy of the cases are exactly like those of the acute dyspepsia, or uncomplicated acute gastro-intestinal catarrh of infancy and childhood. The treatment of all these different forms will, therefore, be discussed at a later occasion.

The management of Asiatic cholera, when occurring at an early age, differs in no way from that required in the adult.

4. *Dysentery.*

The sufferings from dysentery are so intense, and the dangers from its acute or chronic state so threatening, that active measures must be taken at once. A brisk purgative ought to precede every other treatment. Castor oil in sufficient quantities, or calomel—according to age—in doses of from one to eight grains, will have a favorable effect, the latter acting both as a laxative and a disinfectant. The general rules of medicinal and hygienic treatment are those I laid down in my book on “The Intestinal Diseases of Infancy and Childhood” (G. S. Davis, Detroit, Michigan, 1887). It is these by which I shall be guided in most of the following remarks.

The food must be liquid. Milk and strained farinaceous decoctions must be the exclusive diet for the first acute stage. It is on the general condition of the patient that the administration of other articles of food, such as jellies, beef- or mutton-broth, egg, or alcoholic and medicinal stimulants (either general or cardiac), will depend in the course of the disease.

Great sensitiveness of the left hypogastric region and local heat will be alleviated by the application of ice. Very young infants, however, bear ice but a short time, whether applied to head or abdomen. I advise to watch the effect of the application either of the ice-bladder or the ice-cold cloth. Now and then, even in adults, we meet with an idiosyncratic incompatibility with cold. That has to be taken into account. Indeed, quite often warm applications of either water or

poultices prove more efficient in regard to the two indications, which consist in alleviating irritation and reducing temperature.

The subnitrate and the subcarbonate of bismuth do not only cover and protect the mucous membrane, but have also a decided antifermentative effect. Thus bismuth is surely indicated in irritated conditions of the mucous membrane; it seldom fails when given in sufficient doses. There is no harm in sometimes giving it in such doses that part of the introduced material will pass through the entire length of the intestinal tract without undergoing decomposition. As its taste is not disagreeable, it may be given together with tannin and opium; the daily dose ought not to be less than one drachm or a drachm and a half (4.0 to 6.0). At the same time the passages ought to be examined as to their reaction. Abundant acid, so frequently found in the slightest intestinal anomalies, requires the additional administration of alkalies. In most cases carbonate of lime is preferable to either magnesium or the carbonate or bicarbonate of sodium, the salts of both of which are apt to increase diarrhoea. Sometimes, particularly when the stomach can be relied upon, the salicylate of sodium may be added to the internal treatment. Beside the favorable effect of the sodium in the intestinal tract, the salicylic acid may prove beneficial both by its antifebrile and disinfectant action. Salol, one or two grains, or resorcin, one-quarter or one-half of a grain, may take its place. The latter is better tolerated than the former, but salol has a better chance to reach the lower part of the intestine.

Opium and its alkaloids are invaluable in the treatment of intestinal ulcerations. The objections to their use are decidedly exaggerated. Such accidents as have been reported in the journals as resulting from the administration of opium must be attributed to the fact that the dose was either absolutely or relatively too large, compared with the idiosyncrasy of the patient. Dysentery both requires and tolerates larger doses of opium than an average diarrhoea, no matter whether the latter be the result of catarrh or ulceration of the small intestine or the cæcum, or the upper part of the colon. In this respect dysentery stands abreast almost with peritonitis. The main

indications are to relieve pain, reduce peristalsis, and diminish the copious serous secretion; no other remedy fulfils all of them so well. For this purpose it ought to be given internally; for enemata containing opium may act favorably, but the more intense the tenesmus and the greater the hyperæmia or the more extensive the ulceration, the less reliance can be placed on its effect, and the amount of the opiate thus brought into real action cannot be estimated. Among all the opiates I prefer a tincture, or the wine, or opium in substance, or Dover's powder; but rarely have I injected morphia under the skin. The effect of the drug is easily watched and controlled, by commencing with moderate doses, not repeating them too often, and being guided by the effect obtained. If opium is to be discarded, opium with hyoscyamus, or with belladonna, or hyoscyamus or belladonna alone, may take its place temporarily. Severe tenesmus may require the painting of the protruding part with Magendie's solution.

Astringents may either be given in combination with opium or separately. They are expected to pass wholly or partly through the entire length of the intestinal canal, thus coming into contact with the inflamed and ulcerous mucous membrane. Among those eligible are tannin, gallic acid, and vegetables containing the same (ratanhia, catechu), besides subacetate of lead, nitrate of silver, and pernitrate of iron.

The daily dose of tannin, when it is to be taken for a long time in succession, is from ten to fifteen grains, subacetate of lead five to ten grains, nitrate of silver one-fourth to one-half grain. The latter ought not to be given more than a week, or two, in succession, for fear of argyria, two cases of which occurred in my own practice, and of my own making, many years ago. All of these medicines are best taken, if possible, in the form of pills. They appear to be better tolerated, and are certainly more effective.

The use of keratin, when it becomes handier and cheaper, will facilitate their efficiency to a considerable extent.

Another antiseptic which I have frequently administered internally in every description of intestinal ulcerations, in both acute and chronic form, is naphthalin. For its doses, and the methods of its administration, and some account of its effect

on intestinal ulceration in general, I refer to the chapter on typhoid fever. We have to expect a great deal from such topical medication, and it appears that it will be one of the great refuges in all infectious diseases whose principal localization is in the intestine, as, for instance, Asiatic cholera. With creolin I have no personal experience as yet.

Adults will take from fifteen to seventy-five grains daily, in powders, capsules, or mucilage. Children bear, as a rule, according to their ages, from one-half of a grain to two or three grains, every two or three hours, in some mucilaginous substance. Some do not bear it well, but when such is the case, the stomach will give warning at once.

The temperature will but rarely be so high as to require antipyretic medication. Frequent enemata will often reduce it effectively. Very young infants may demand an occasional dose of antipyrin or acetanilid (antifebrin) when the heat threatens either the nervous system or the normal structure of the tissues of the body.

Consecutive paralysis requires a mild galvanic current in the beginning. The daily application both to the spinal cord and the extremities need not exceed ten minutes; the electrodes must be large, and the current reversed after five minutes. After a few weeks the interrupted current may be added the same length of time, but it must be applied to the paralyzed muscles only. Together with the latter, strychnia or (and) phosphorus may be used, in daily doses of one-thirtieth of a grain in the case of a child of four or five years.

The local treatment of chronic dysenteric ulcerations requires the use of enemata. Their indications vary. They are to evacuate the bowels, or to reduce the irritability of the diseased intestine, or to accomplish an actual cure. These indications cannot be fulfilled separately; sometimes two, sometimes all three, can be at the same time. The nature and quantity and the temperature of the liquid to be injected depend in part on the end aimed at, in part on the irritability of the individual intestine. Sometimes the bowel objects to the introduction of small amounts; sometimes, however, large quantities are tolerated very easily indeed. To introduce small amounts, the selection of the syringe is a matter of

indifference, provided the liquid enters the bowel gently and without pain. To inject large quantities, undue pressure and local irritation must be avoided. Thus the fountain syringe alone will answer; it ought to hang but a trifle above the level of the anus, say from six to twenty inches. The temperature of the liquid is not always a matter of great importance. Some recommend the injections to be ice-cold, some, however, tepid; both are frequently recommended as panaceas. But the practitioner will soon ascertain that some bear and require the one, some the other, some, indeed, very hot ones.

In my experience, for the large majority of patients tepid injections answer best. Not rarely is the intestine in such a condition of irritation that even small quantities of a very cold fluid are expelled at once. And again, there are cases in which enormous amounts of either cold or warm water are readily received. To accomplish the purpose of evacuating the bowel, plain water will often suffice, but three-fourths of one-per-cent. solutions of salt in water will usually prove more acceptable. Additions of bitartrate of potassa, or castor oil, have proved so uncomfortable in my cases that I have discarded them long ago. However, when the secretion of mucus on the rectal and intestinal mucous membranes was very large, one- or two-per-cent. solutions of bicarbonate of sodium answered very well indeed. For the purpose of clearing the intestines, either of fæces or the morbid products, a single enema is insufficient. It ought to be repeated several times daily. When much mucus is secreted and tenesmus intense, it may be applied after every evacuation. In many cases the substitution of flaxseed tea or mucilage of gum acacia will prove advantageous. I have had to continue them for weeks for both their evacuating and alleviating effect. When, however, the latter alone is aimed at,—that is, when tenesmus is to be relieved,—small quantities will usually suffice. An ounce or two of thin mucilage, or starch-water, or flaxseed tea, with tincture of opium, or better, extract of opium, prove very comforting. Glycerin in water has been recommended for the same purpose. The former alone, or but slightly diluted, irritates, nay, cauterizes. It will require close judgment and individual experience to ascertain the degree of dilution, if it be used at all.

When a local curative effect is aimed at, injections of small quantities are sometimes insufficient. As the local lesions are often extensive, the amount to be injected must be pretty large. Almost always astringents are required. Sulphate of zinc, or alumina, subacetate of lead, nitrate of silver, tannin, chlorate of potassium, ergotin, salicylic and carbolic acids, and creasote have been recommended. Of the more common astringents I prefer alumina or tannin in one-per-cent. solutions. Creasote answered well in solutions of one-half of one per cent. Salicylic acid resulted more frequently in pain than in benefit. Carbolic acid, in solutions of one-half of one per cent., has proved very beneficial, but I have learned long ago to be very careful in regard to its administration because of its poisonous effects, particularly in very young patients.

Injections of nitrate of silver may prove very useful in cases not quite acute. Before the solutions of a quarter of one per cent., or of one or two per cent. are injected, the intestine ought to be washed out with warm water without salt. After the injection has been made it ought to be neutralized with a solution of chloride of sodium; it is still better to wash the anus and the portion of the rectum within easy reach with that solution before the medicinal injection be made. For even the mildest solutions, when acting on the sore sphincters, are liable to give rise to intense tenesmus when no such care has been taken.

When the ulcerations are but few, or in the lower portion of the bowels only, small quantities suffice. But extensive lesions require large injections, the patient being on his side, or in the knee-elbow position. In these cases the nozzle of the fountain syringe must be lengthened by attaching to it an elastic catheter, which is introduced as high up as possible, after the same plan that nutrient enemata are to be given. In a number of cases, both mild and severe, where neither the usual astringents nor nitrate of silver appeared to answer, I have been very successful these twenty years, when resorting to injections of subnitrate of bismuth. The drug is mixed with six or ten times its amount of water; of this mixture from one to three ounces (30.0 to 100.0) are injected into the bowel which has been washed out previously, twice or three

times daily. The success was satisfactory, though a large portion of the injected mixture was soon expelled.

Suppositories containing the above substances may prove beneficial. But in order not to irritate they must be so soft as to melt readily. They may always contain some opium. But its admixture is not always sufficient to relieve the irritability of the rectum. Indeed, to accomplish this end opium must at least begin to liquefy and to be absorbed, and absorption cannot be relied upon except where a part, at least, of the mucous surface is in a fair state of integrity. When no suppository can be tolerated, and the administration of an opiate to the intestine is indicated, the painting with Magendie's solution, or the injection of a small quantity of olive oil with tincture of opium, may still be tried. The local application of cocaine relieves pain, but the drug is readily absorbed, and great caution must be used in its administration because of its poisonous effects.

5. *Scarlatina.*

Preventive measures of the strictest nature are indicated in regard to no disease more than in the case of scarlatina. Its mortality is very great, in some epidemics even excessive; and when the child survives, there may be a large number of sequelæ which either terminate fatally, or in persistent injury to health, and in the curtailing of the enjoyment or usefulness of life. Among these are cardiac diseases, glandular affections, suppurative otitis, and nephritis. The first attack of the latter is not limited to the second or third week, when, it is true, it is mostly met with. For I have seen it to appear on the thirty-seventh day of the disease, and Bäumler reports the case of a child with hemorrhagic nephritis which started as late as the forty-fourth day.

There is another momentous indication for strict prevention. The facility of being attacked is by no means so great as, for instance, in measles. It is but rarely that any of the young inmates of a house escapes contagion when measles has attacked one of them. The virus of scarlatina, however, is less catching. Infants of less than a year suffer but rarely, though very severely when taken. The vast majority of those affected

are less than five years old. After that period susceptibility becomes less from year to year, so that, indeed, a child who has been protected against scarlatina during its first half-dozen years attains a certain degree of immunity for the future.

There is no reason to believe in a primary origin of scarlatina. The efficacy of the virus is so persistent, and it clings so long to clothing, bedding, and furniture, that it can be carried and transmitted to long distances by persons, towels, toys, letters, and even domestic animals and articles of food. It is transferable through the whole duration of the disease, from the incubation to the disappearance of the very last symptoms. The incubation of scarlatina may last but a few hours, like that of diphtheria and erysipelas, or as long as nine days; in this it differs greatly from measles, variola, and varicella. The last symptoms may not disappear until long after the fortieth day, which, it is true, is the average termination. The fine desquamation of the second week may have terminated entirely, but the gross peeling, particularly of the hands and feet, extends frequently to the end of the seventh or eighth week. It carries contagion as well as the desquamation of the former weeks, or as the breath of the patient, or his expectoration in the earlier periods. So slow is sometimes the process of elimination that Spottiswood Cameron claims that the end of the disease is seldom reached before the eighth week, and not always in the thirteenth. Whether the urine or the alvine dejections of the patient can spread the disease is not quite certain; but as long as there is an uncertainty they ought to be treated as dangerous elements, and disinfected and removed.

Sore surfaces appear to admit the poison. Scarlatina will enter through the integuments denuded by eczema. I believe I have lost two patients because I operated upon them during the prevalence of an epidemic of scarlatina. A child of four years, on whom I resected the head of a femur, was taken with the eruption on the fourth day and died. Another one was stricken down thirty-six hours after the resection of a tonsil. In both cases I had reason to believe that I opened an inroad to the invading poison.

Dispensaries and schools are the hot-beds of scarlatina. A single case waiting in the anteroom of a public charity until it

be seen and diagnosticated may destroy a dozen innocents while craving the blessings of public beneficence. Schools ought to be closed during an epidemic. No child coming from a house with scarlatina must be admitted. Such as have been removed from the dangerous neighborhood and not exposed since may, after thorough disinfection of the clothing worn during the time of exposure, be allowed to return after an interval of ten days.

The inunction of the patient with pork, vaseline, and similar substances adds to the safety of the attendants by preventing the carrying into the air of the eliminated particles of epidermis. The soaping and bathing contributes to the same end, but is no reliable safeguard because the virus penetrates the whole skin down to the rete Malpighii.

The sick and their attendants must be strictly isolated; during the winter, when the warm air rises and carries contagion with it to the upper part of the house, in the highest story. Whoever enters the sick-room—friend, nurse, or physician—ought to wear special clothing while inside, or at least a linen or india-rubber cover. The physician must disinfect his hands after leaving his patient. In the room the air ought to be changed often. Draught can be avoided by means of screens. No dry linen or clothing must leave the room. It must be soaked in water, or better still, in a disinfectant fluid, before it is carried off, and boiled in soap and water immediately after arriving in the laundry. The same rules which hold good in the cases of infectious and contagious diseases in general, those which refer to the disinfection of the room and furniture, and public vehicles which may have been used, must be obeyed to the letter. No room, in fair weather, will afford the same safety as a tent would, and in no disease, with the exception of variola and diphtheria, is the erection of special hospitals more needed than in scarlatina.

The medicinal treatment of mild cases may be expectant. Cooling drinks, ten or twelve drops of dilute muriatic acid in a goblet of water, will often suffice. The food must be liquid, or at most semi-solid; in the first week milk and farinacea. Constipation in the first period is aptly relieved by a dose of calomel or a vegetable aperient. Diarrhœa, particularly in

the later stages, requires bismuth, opium, perhaps astringents, such as lead, and at all events antifermentatives, such as resorcin, salol, or naphthalin; the mild form of stomatitis and pharyngitis, half a grain or a grain of chlorate of potassium in a teaspoonful of water every hour or two hours. The frequent complication with diphtheria must be met by the appropriate treatment of the latter; it will be the subject of special remarks at a future time. Diphtheria setting in on the fourth or fifth day is but seldom alarming; when on the first day, or previous to the scarlatinous eruption, it is quite ominous. In this case it is often accompanied with rapid glandular swelling and serious symptoms of sepsis. Applications of ice to the swollen neck will often keep the tumefaction within certain limits. When gangrenous degeneration of the glands cannot be prevented, and local suppuration occurs in the centre, deep incisions and the local use of carbolic acid are required in the same manner in which the same affection is dealt with in diphtheria. In milder cases, two applications daily of one part of iodoform in eight or twelve of collodion have a good effect.

High temperatures do not require very active treatment unless they result in functional or organic changes of the heart or brain. As long as these two organs perform their duties normally the temperatures may be left alone. A very frequent and feeble pulse with a high temperature requires, beside a cardiac tonic, quinia (with the restrictions mentioned in No. 2), washing with cool water, or water and alcohol, cold applications to the heart, or a warm bath. Antifebrin and antipyrin are not to be recommended in these conditions. Delirium and somnolence, also convulsions, may be the result of high temperatures, and, particularly when the whole body, feet included, is hot, require the same treatment. Antipyrin, however, I have never seen to reduce the temperature in congestive or inflammatory conditions of the brain. The latter may be the direct result of the infection, but also at a somewhat later period of rheumatism. In either case the treatment does not materially differ from what it would be under ordinary circumstances. The latter form requires salicylates, both the application of ice to the head, counter-irritants to the feet

(sinapisms) and intestines (calomel), and in most cases leeches to the septum narium or mastoid processes. The vital indication proceeding from the condition of the brain is here of the greatest importance.

When the same symptoms set in with or without a high rectal temperature and cold extremities, a mottled skin, and a cyanotic hue, the large amount of the virus which has invaded the system demands strong stimulants,—ammonia, musk, and camphor. They act better than alcohol. To their internal administration may be added camphor dissolved in almond oil, sulphate of spartein in water, subcutaneously, in free and frequent doses. These symptoms of poisoning while the temperature is but low bear opiates (morphia, one-fiftieth or one-twentieth of a grain, in repeated doses) quite well. Universal heat requires tepid bathing, with cold affusions over, or applications to, the head; a cool surface, with cold extremities and frequent and filiform pulse, hot bathing and powerful friction, and hot enemata, with stimulants.

Vomiting before and with the eruption is a frequent symptom. When moderate, it may be left alone; no food must be given for a number of hours, ice-water in teaspoon doses, or an ice pill, every five or fifteen minutes. When quite severe and exhausting, small doses of an opiate, once every hour or two, will be found useful. In a few obstinate cases the muriate of cocaine in doses of one-twentieth or one-fifteenth of a grain answered well; in others, arsenious acid, every two hours, a two- or three-hundredth part of a grain.

One of the early complications is rheumatism. It makes its appearance often on the third or fifth day. In some cases it is muscular, and then mostly confined to the lower extremities. In others articular, but with less swelling than we are inclined to expect. Indeed, articular rheumatism in general exhibits the usual symptoms to a less characteristic degree than in adults, but they are so pronounced as not to be mistaken. This rheumatism ought to be treated at once, for endocarditis complicates it in infancy and childhood very much more readily than in advanced age. Most of the cases of scarlatinal endocarditis carried into later life are due to rheumatism. The joints ought to be well covered with soft cotton, and salicylate

of sodium given every two or three hours in doses of from four to ten grains.

Endocarditis and pericarditis, without rheumatism, are but rare occurrences. Ulcerous endocarditis I have not seen except with serious general sepsis, caries of bones, thrombosis of a sinus, and other symptoms of general pyæmia.

Suppurative inflammations of joints are very rare. They form part of generalized pyæmia. There is an affection of the epiphyses, however, which is very common and differs from the above. It consists in extensive hyperæmia, and possibly inflammation. Clinical observation yields quite a number of cases of infectious diseases, but mainly scarlatina, in which during convalescence, and long afterwards, the region of the joints are swollen and painful. This epiphysitis is the cause of the rapid increase in the growth of children who have passed through scarlatina, but may also be the cause of serious changes, from simple "growing pains" to suppurative separations of the epiphysis from the diaphysis. In every such case, during convalescence and afterwards, the joint ought to be well supported by soft splints, emplastr. hydrarg., iodoform collodion, absolute rest enjoined, and phosphorus given in three daily doses of a two-hundredth of a grain, or more.

The complications with pneumonia and pleuritis are quite frequent; the latter is apt to be purulent; if so, its existence explains in many cases the continuance of the high temperature. In every case, purulent or not, the indications are opposed to an expectant plan of treatment. Both general and cardiac stimulants and tonics are required.

Hemorrhages are not frequent, but ominous when they occur. As a rule, they are the result of embolic processes, and complicated with local gangrene. Spontaneous thromboses, however, of the extremities, or the cheeks ("noma"), are not so frequent in scarlatina as they are in measles.

The presence of pemphigus during the eruption appears to indicate a high degree of vaso-motor paralysis. It is an ominous complication and requires stimulants as above. Urticaria is more troublesome than dangerous. The inunction with pork, vaseline, or glycerin—soothing and pleasing in most cases of scarlatina—may suffice to relieve it. Now and then mild

alkaline lotions (bicarbonate of sodium in water, 1 to $\frac{1}{100}$), or the washing with carbonated alkaline waters (from the siphon), or with a proper dilution of carbolic acid (1 to 200), will prove beneficent. When the burning and itching is quite annoying, naphthol five parts, and vaseline one hundred or one hundred and fifty, may be tried to advantage.

The rules for the general treatment of scarlatina must necessarily be very much like those applicable to all infectious diseases. Thus in regard to them, and particularly to the debility and failure of the heart, I refer to my remarks on the treatment of patients suffering from typhoid fever. In scarlatina, and eruptive fevers generally, there is, however, an additional indication resulting from the participation of the skin in the process. Indeed, more than in other diseases, the hygiene of the surface has to be attended to. During the course of the disease, particularly during desquamation, a tepid bath, with soap, ought to be given from time to time, and the temperature of the room and bed kept at equal heights. While the former is to be cool, the body must be well covered and kept warm. This is the more necessary, as nephritis may set in at any time during many weeks. This serious complication, it is true, may occur though the patient be kept in bed, in consequence of voluminous elimination of epithelia, and also perhaps of bacteric invasion, but exposure and sudden changes of temperature will always hold their place in etiology, in the minds of those who do not forget to notice the living clinical case beside the dead microscopical excrement.

In this connection, while I reserve the subject of nephritis for some future occasion, I will only urge the advisability of beginning the treatment of scarlatinal nephritis with a moderate dose (one-half to one grain) of calomel repeated from time to time, through the first two or three days. Its purgative effect, if too great, may be stopped by a small dose of opium given after every loose movement.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

BY F. FORCHHEIMER, M.D.,

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(Continued from December Number.)

III.—STOMATITIS MYCOSA.

Synonymes.—Thrush, Soor, Mundschwämmchen, Muguet.

THE nature of this disease, now so clearly understood, was entirely unknown until the parasitic growth which causes it was discovered. On account of the fact having been thoroughly established, and because the life history of the parasite is comparatively well known, thrush becomes one of the diseases which can be looked upon as a paradigm by which other infectious diseases can be regulated.

The historical development of the subject may be divided into two periods,—that before the discovery of the *saccharomyces albicans* (about 1840) and that following this date. In the first period we find the older writers, and especially the French authors. It is almost a certainty that Hippocrates described thrush under the heading of *στέματα ἀφθῶδες*, and Galen was also acquainted with the affection. The authors following them looked upon the affection either as ulcerative (Avicenna) or vesicular, papular or pustular (Boerhaave, Rosen v. Rosenstein). Rosen (German edition, translated and edited by Murray, professor in Göttingen, 1774) has, like all his predecessors and a great many of his successors, described many forms under the head of "Schwammgen." He has evidently seen cases of diphtheria which he writes about, possibly some other forms of stomatitis, but, without doubt, cases of thrush. He has made accurate observations in connection with the latter,—about the effect of cleanliness, the possibility of producing irritation of the nipples of the nurse, a connection between gastro-intestinal troubles and the sore mouth,—and advises the use of some remedies which, it is strange

to say, are still favorites with some authors on children's diseases (rhubarb and magnesia!).

In 1786 the Société Royale de Médecine offered a prize of twelve hundred livres on the causes of the disease known as "millet, blanchet, muguet" (thrush). This was done because of the fact that so many children were dying of the affection at the Hôpital des Enfants. The prize was divided between four, out of six competing, one of whom, Van Wimperse, succeeded in localizing the affection anatomically. This was, as Bohn states, the first attempt to describe the disease as an independent affection, and the result was an impetus given to observation in a different direction from that of former authors. After 1826, when Bretonneau first described diphtheritis, a name which he afterwards changed to diphtheria, it was held by a great many French authors that thrush was diphtheritic in nature, and even to the present day we still find French writers speaking of a "stomatite pseudo-membraneuse" when the invasion of thrush is very extensive. From this time until the discovery of the cause of the disorder very little progress was made beyond the discovery that the disease did not limit itself to children, but was also found in adults suffering with lingering or wasting diseases. The result was that great stress was laid upon this fact, the local nature of the disease was overlooked, and the fearful mortality spoken of by Valleix ("*Clinique des Maladies des Enfants nouveau-nés*," 16, 1838)—twenty cases dying out of twenty-two—asccribed entirely to this affection. This view, somewhat remodelled, was again taken up by Parrot (1874), who ascribed the predisposing cause of thrush in all instances to the condition he calls athrepsia, a view which, it will be seen, is altogether untenable. We now come to the second historical period, in which the cause of thrush was first discovered. There are a great many observers who saw the *saccharomyces*, but to Berg, of Stockholm, is given the credit of first having observed it, at least of first having described it accurately and made experiments with it, showing its nature, the possibility of cultivating it, and its inoculability. His description is the one to be found in most works and articles upon the subject of thrush; but Robin (1853, "*Histoire Naturelle des Végétaux Parasites*") first named the

vegetable parasite "oïdium albicans," a name still employed, although subsequent observers have been unable to classify the growth under this heading. The old name is now chiefly used by French authors (Fossanagrives, Simon), who continue to quote the older experiments, although progress has been made since Robin. Grawitz (*Virchow's Archiv*, 1877, p. 546 *et seq.*), following the methods indicated by Brefeld, was the first to study the thrush fungus according to modern ideas, and with the following results: he obtained pure cultures in a fluid made up of a solution of glucose, one per cent. of ammonium tartrate, and mineral salts obtained by making an extract of cigar-ashes. He also used a decoction of baked plums or currant jelly diluted with equal parts of Pasteur's liquid. In these fluids he demonstrated that the thrush fungus could be cultivated, but only in a peculiar state; that of spores with the mycelium badly developed, the more sugar there was present the greater the number of spores; the more salts, the greater the number of threads. From these he made pure cultures, and came to the conclusion that the yeast-cell or spore was the forerunner of the mycelium, and according to the nature of his fluid he could cultivate thrush fungus rich in mycelium or made up principally of spores which resembled yeast-cells. There are two ways, then, in which the fungus grows,—one from clusters of gonidia attached to the mycelium, another from free spores. He then states that the fungus of thrush is not oïdium albicans but the ordinary mycoderma vini, which produces a fermentation and which grows upon fruit juices, but only in the form of spores. Grawitz then furnishes the proof of his having described the thrush fungus by taking a pure culture of the mycoderma vini and producing thrush in five young dogs which were fed upon cow's milk. About the same time Reess published his observations (quoted from Bohn), in which he comes to the conclusion that the thrush fungus is not an oïdium but a saccharomyces-producing fermentation. He was not able to convert the mycoderma vini into a thrush-producing fungus or *vice versa*, and therefore proposes the name saccharomyces albicans until the exact relation of mycoderma and the thrush-producer is positively settled. A. Baginsky (*Deutsche Med.*

Wochenschrift, 1885, p. 866) has made some experiments by means of plate cultures on meat peptone, gelatin, and potatoes, which were considered pure cultures by Koch. On potatoes he obtained the yeast form, on bread the same, especially upon the surface, and very little mycelium. In test-tubes the surface proliferation was that of yeast-cells, while in the deep it was in the form of mycelium. He does not think the fungus is mycoderma, and mentions Stumpf (whose publication I could not obtain), who thinks that the fungus is a mixed one, made up of oïdium and yeast.

It will be seen from this short review that the nature of the fungus is not cleared up; but so much seems established, that we are not dealing with a milk fermentation, but one that causes splitting up of the hydrocarbons into alcohol and carbonic acid.

Etiology.—There can be no doubt of the fact that the *saccharomyces* is the prime cause of the stomato-mycosis. But, as is the case with so many infecting substances, it is necessary that the fungus be deposited upon soil which is favorable for its growth before a diseased condition can be produced. We will have to examine as the two etiological factors, first, the fungus, second, the patient upon whom the fungus grows. The natural history of the fungus is, briefly, as follows: It is found pretty widely distributed; in the human being, upon every mucous membrane,—the respiratory, the alimentary, the genito-urinary,—and, in several instances, in the parenchyma of the internal organs, the brain (Zenker), the lungs (Parrot, Birch-Hirschfeld). E. Wagner discovered the fungus growing into blood-vessels, and from thence the possibility of a general infection is a matter readily explained. In the wards of hospitals where the disease is most common the air will probably be found full of spores, which develop as soon as they come in contact with the proper soil. On account of the fact that most of the observations which have been recorded have been made as the result of hospital experience, they should be taken with some allowance, for the air being loaded with these germs, it is impossible to draw conclusions to which some objection could not be raised. A single observation made upon an infant in a private family under good sanitary surroundings

would, therefore, be of more value than those made in wards where the poison is ever present. Unfortunately, however, we come here to an insurmountable difficulty. If the germ is the mycoderma vini, it is ubiquitous, and we could hardly determine where it came from in the individual case, except from the air. All authors agree that the disease is found most commonly in infants during the first two or three weeks of life, although it may be found at any age. Several observers (Trousseau, Haussman) have found the fungus upon and within the female genitals, and Haussman ("Die Parasiten d. weibl. Geschlechtsorgane," Berl., 1870) lays stress upon the fact that infection of the newly-born takes place from the genitals of the mother during birth. The possibility of such an infection cannot be denied, but no proof of the fact has, as yet, been offered. Thrush of the vulva or vagina is rare (the large works on obstetrics and gynecology do not speak of it at all); but admitting that the parasite does occur without symptoms, the proof would have to be furnished that children born from such mothers are more liable to stomatitis mycosa than others. Since my attention has been especially called to a possible causal connection between the two conditions, I have examined pregnant women coming under my care for the last four years in this direction. During this time I have found but two cases in which thrush of the vulva could be diagnosed,—one a diabetic patient, the other suffering from vulvitis with lacerated perineum and prolapse of the posterior wall of the vagina. In neither of these cases did the children show signs of thrush, although the child of the first mother had to be brought up without mother's milk, and in neither instance were efforts made to prevent the development of the parasite if it had been present. Every one who has studied the subject carefully will have come to the conclusion that thrush can be carried by the nipple, either of a nurse or of the feeding-bottle. The latter is especially the case in hospitals, where the nurses are not too careful as far as cleanliness is concerned. For a short time I was officially connected with a foundling hospital, principally for the purpose of helping in an attempt to reduce the fearful mortality which existed in the institution. I had the infants taken to a different building; unfortunately,

I had no control over the nurses, so that I found myself thwarted and gave up in despair. Of some twenty infants brought in, every one had thrush; as far as I could discover, only one of the patients survived after having been removed from my care. The nurses prepared a large quantity of food, filled three or four feeding-bottles of the patented variety, and these were passed from one child to another. The bottles were never emptied, nor, as far as I could find out, ever cleaned. If we were to judge of the nature of stomato-mycosis from this experience, what an unsatisfactory condition we should find! yet this has been done, especially by the older French writers, and even to-day the same thing is being done.

The parasite itself grows, as Grawitz has shown, in two distinct ways. It consists of mycelium and spores. The mycelium is made up of long threads having single contours, which are developed in segments. They refract the light very much, their segments are about equal in length, and at the end of the thread generally branched. When two segments come together we frequently have the fruit developed, which is made up of spores. The threads of the mycelium develop in their turn from these spores. They are oval bodies, resembling yeast-cells, of the same optical reaction as the mycelium. The parasite can be propagated either in the way just described (production of fruit from which come the spores) or the greater part of the protoplasm of the spore goes immediately to the production of new spores, very little, if any, being left for the mycelium. This, as has been stated, depends upon the material upon which the parasite is cultivated (Grawitz, Baginsky).

In discussing the nature of the soil we must premise that the parasite has never been investigated in this direction beyond the experiments quoted above (Grawitz, Baginsky); the former made before the days of modern bacteriology and the latter fragmentary only. It is indeed doubtful whether the question about to be discussed could be solved in this manner, but light could certainly be thrown upon it by thorough bacteriological and pathological experiments. In our given case the soil is a child and the question, Why will one child be affected with stomato-mycosis and another not? The fact

that human beings, both adults and children, are affected by this disease when in bad health is admitted on all hands. It remains to be seen whether we can state in what this element of bad health must consist. I have seen several instances in which apparently perfectly healthy infants have been affected with thrush. Epstein (*Prag. Med. Wochenschrift*, 1880) mentions the case of a woman who nursed two children, one of whom had thrush, and the other one did not get it. I have met with the same experience, but one which renders conclusions difficult to be drawn. A woman presents herself with her infant, apparently healthy in every respect (details are unnecessary) except that the child has thrush. In the same ward there is an infant with cholera infantum,—bottle-fed, marantic; in order to save this child's life the mother of the infant with thrush is utilized as nurse; the child recovers without thrush. Here is a case in which a healthy child has thrush and a sick child who is exposed to infection does not get it. As far as general good health is concerned, it must be admitted, then, that when it has an effect upon the production of thrush it must be an indirect one. That such is the case must be admitted upon close examination; the indirect effect is produced by some change in the mouth by means of which a proper soil is formed for the fungus. In what does this change consist? A great many theories have been advanced in solution of this fact, which has been known for a long time. First comes the reaction of the infant's mouth. When the *oïdium albicans* was first looked upon as the cause of stomatitis mycosa, acid reaction was sufficient to satisfy any one why stomato-mycosis should occur in that given case. At the present day we know that the parasite of thrush will grow both upon alkaline and acid soil, but that it grows better upon alkaline or neutral soil, and only grows in an imperfect or peculiar way in an acid fluid. If, then, the reaction of a newly-born infant is acid, as has been shown by Seux and Ritter v. Rittershain, although not universally so, this would give us a form of thrush characterized by the production of the yeast-cell form principally and not as we see it in the mouth.

Next comes the question of the influence exerted by the

character of the epithelium. It has been stated that for the development of thrush flat or squamous epithelium is necessary. At present there are so many cases on record in which the *saccharomyces albicans* has been found in places containing no flat epithelium (stomach, small intestines, lungs, brain, blood-vessels, etc.) that this cannot be admitted as an etiological factor. Where Grawitz has found the yeast-form cell only in the stomach, Parrot ("L'Atlhrepsie," p. 224) claims that both mycelium and spores are found superficially, which his plates do not show. This latter fact, however, is not important in this connection, as we wish to show only that flat epithelium plays a very secondary rôle in the production of thrush. There can be no doubt but that it is observed most frequently in the mouth and the pharynx, but this does not mean that it does not exist in other places.

The only etiological factor which is admitted on all hands is the existence of a stomatitis catarrhalis, either before or with the appearance of thrush. A child suffering from any form of stomatitis (as has been mentioned in connection with stomatitis aphthosa) is more liable to thrush than one without such an affection. Whether the catarrhal stomatitis is essential to the production of thrush, or whether another element is to be taken into consideration, is difficult of decision. Rajewsky has proven that an irritation of a mucous membrane is necessary before it can be made diphtheritic. Is it the irritation or the disturbance of continuity of the epithelial covering which makes the mucous membrane pervious to the poison? In a case of thrush, is it the mechanical dislocation of the swollen epithelium, the separation of the cells,—all concomitant with stomatitis catarrhalis,—that predisposes such a membrane to thrush? There are some facts that point in this direction. Every one who has studied the subject admits that spores of the *saccharomyces* are found in the mouths of perfectly healthy children: in cultures made for me they were found four times out of twenty-two. They do not seem to develop under these circumstances; they do not obtain a foothold; they are, in all probability, prevented from developing by the movements within the mouth, especially in older children. Given a case, however, in which the mouth, especially of the young infant,

is slightly bruised or its epithelial coating injured from attempts at nursing from badly-formed nipples, from a hard nipple of a feeding-bottle, with a cleft palate or what not, and thrush follows very rapidly. It will be seen from this that the feeding-bottle may be deleterious in more than one direction as far as thrush is concerned. These facts, taken in connection with some observations in the pathological anatomy of thrush, would make it seem that the results of a catarrhal trouble are to be feared more than the catarrhal stomatitis itself; in other words, that a mechanical condition must be produced which is favorable to the development of the parasite and which can exist either with or without stomatitis catarrhalis. It is impossible to conceive of an erythema or inflammation of the mouth which does not produce conditions favorable to stomato-mycosis, and all modern observers admit the intimate connection between these two conditions. Resulting from this comes the statement that all those conditions which produce stomatitis catarrhalis will favor the development of stomatitis mycosa.

It is a self-evident proposition that when the parasite is where circumstances are most favorable it will grow best. For this there is necessary an amount of comparative rest which can only be obtained under certain conditions. From the pathological anatomy it will be seen that it grows in places where it is least disturbed. From the knowledge obtained through clinical evidence we know that it grows best in those subjects who subject their tongues or their mouths to least motion. We find it, therefore, principally in infants, or in children sick with other diseases; in adults, in all forms of wasting disease or in acute disease accompanied with great debility,—all of which presuppose a condition in which the function of motion of the upper part of the alimentary tract is greatly diminished.

Pathological anatomy.—The parasite is taken up between the epithelial cells, so that at first the surface of the mucous membrane is comparatively free from any eruption. As a rule, the first development takes place so as to separate one layer of epithelial cells from the other,—this development is in the form of spores without mycelium. From this original implantation

the parasite grows in both directions,—towards the surface of the mucous membrane as well as towards the connective tissue. In either direction do we find mycelium being developed,—to a very limited extent in the direction of the free surface, but thoroughly well in the direction of the connective tissue. Once the basement mucous membrane has been perforated and the character of the growth seems to change so as to produce those pictures which have been put down in the books as the classical appearance of the parasite. From this method of development it will be seen why a squamous epithelial coating will favor the growth of *saccharomyces albicans*, and why, on the other hand, mucous membrane lined by cylindrical epithelium is not favorable to its growth.

In the mucous membrane with flat epithelial cells, the parasite can develop between the individual layers of cells; in the mucous membrane with cylindrical epithelium, there are no layers between which the spores can develop. When they fill up the follicles then the growth goes on,—it is the surface growth that we are referring to,—but especially well into the submucosa and the nervea. Very much has been said about the exact relation which is borne by the parasitic growth to the outer epithelial layer of the mucous membrane. A careful investigation of each case will show that the beginning of each growth is usually as has been described, that the *saccharomyces* then develops so as to implicate all the various layers of the epithelium. In attacking the most external layer it develops between the cells, raises them up, surrounds them, embeds them within its rapidly-increasing growth, so that, finally, it is impossible to distinguish epithelium from parasite unless the microscope is used. These facts are of great importance from a therapeutic stand-point. The implication of blood-vessels, which Wagner affirms and which Parrot denies, is a question which does not interest us for the present. But the affection of surrounding tissue as a result of the presence of the parasite is of some importance. The vegetable produces all the signs of irritative change,—proliferation of the cells, especially their nuclei, but no pus. The evidences of irritation are of the most transitory nature and vanish very quickly when the parasite is removed. The question whether or no pus is formed

is at the present day of no importance whatsoever. It must be taken for granted that the *saccharomyces albicans* does not belong to that class of parasites called the pus-formers, as the formation of pus must be looked upon as the exception and not the rule. The extension of the parasitic growth to other parts of the body has already been referred to and will receive discussion in connection with the symptomatology.

On account of the nature of its inception, the growth begins in the form of small spots, which may or may not become confluent. It may then be propagated either from this first crop or, what is more likely, in mild cases, two or more places may become inoculated from the same source. In microscopic preparations we sometimes see one islet connected with the other by threads of mycelium in the connective tissue. In violent cases a deposit of a mass occurs, leaving very little healthy tissue.

(To be continued.)

RECENT OBSERVATIONS RELATING TO INTUBATION.*

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AT the inaugural meeting of this body our learned chairman intimated that the best interests of the Section would be furthered by discussions practical in their bearings. In accordance with this view I have selected as the topic for the evening, *Recent Observations relating to Intubation*.

The subject of intubation has already been thoroughly discussed, and I shall therefore not go over the ground again, but shall confine myself to some of the more important facts

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established by my later experience, the paper thus being an appendix to the article read before the Academy June 2, 1887. This evening I shall present a second series of cases, making, with the forty-seven already reported, a total of ninety-four.

The following table presents in brief a

RÉSUMÉ OF CASES.

UNDER THREE YEARS OF AGE.				THREE YEARS OF AGE AND OVER.			
Age.	No.	Recovery.	Death.	Age.	No.	Recovery.	Death.
6 mos. .	1	0	1	3 years. .	11	3	8
8 mos. .	1	0	1	3½ years. .	5	4	1
9 mos. .	1	0	1	3¾ years. .	3	1	2
9½ mos. .	1	1	0	4 years. .	10	4	6
10½ mos. .	1	1	0	4½ years. .	3	2	1
11 mos. .	4	2	2	5 years. .	5	1	4
1 year. .	3	1	2	5½ years. .	1	0	1
13 mos. .	2	1	1	6 years. .	2	1	1
14 mos. .	1	1	0	7 years. .	3	3	0
1½ years. .	2	0	2	9 years. .	1	0	1
1¾ years. .	12	2	10	11 years. .	1	1	0
2 years. .	8	3	5				
2¼ years. .	1	0	1				
2½ years. .	6	3	3				
2¾ years. .	5	2	3				
Total . .	49	17	32	Total . .	45	20	25
About 35 per cent. recoveries.				About 44½ per cent. recoveries.			

Of the ninety-four cases thirty-seven have recovered: about forty per cent.

Certainly a favorable showing, particularly so when we remember that the larger proportion of cases occurred in thickly-populated districts under the poor hygienic and sanitary conditions existing in tenements. The instances were not selected. Intubation was resorted to, no matter what complication existed, where the stenosis became sufficiently grave to warrant operative interference. Furthermore, I would add that these were late cases; and I shall avail myself of the opportunity here to extend my sincerest thanks to the gentlemen in whose practice these cases occurred, not only for the

honor of having been called in to operate, but also for the privilege, freely and courteously accorded in the greater number of cases, to visit the patients subsequently, in order to superintend the after-treatment.

I do not favor early operation, for it has been my good fortune to see a comparatively large number recover under the faithful employment of the bichloride of mercury and steam. It is my firm belief, and in this I am strengthened by the experience of others, were the bichloride administered sufficiently early, at the inception of the trouble (the precaution being observed that it be properly diluted), a larger proportion would recover, with or without operation.

“Simple truths in practical medicine do more than simply bear repetition: they require it. . . . After the rational and careful administration of the hydrargyrum bichloride, local mercurial symptoms about gums, mouth, pharynx, and intestines are exceptionally rare in infancy and childhood” (Jacobi, *Med. Jour.*, June 30, 1888). Many cases could be cited in support of these views, but I must content myself here with the above positive assertions.

The question of nutrition is of primary importance, and in discussing it we must not forget that the difficulty in feeding may be twofold: it may be due to the anorexia incidental to a nephritis or other complication, or, secondarily, may be due to the mechanical presence of the tube or some injury to the soft parts. In about one-fifth of the cases comparatively little trouble is experienced in deglutition. The insertion of the tube, the flange being directed forward, has not impressed me very favorably. Tubes with an artificial epiglottis are still imperfect and not absolutely safe, but when further improved upon will undoubtedly remedy the trouble in great measure. A trained nurse, one sufficiently intelligent and tractable to follow instructions, will materially facilitate the work of the physician in this respect and improve the chances of the patient. Solids and semi-solids are well tolerated. As regards liquids, the idiosyncrasies of each patient must be studied. Rectal alimentation may be tried, and in a few instances feeding by the stomach-tube or catheter through the mouth or nares has been required. In a number of instances

I have availed myself of a plan to be discussed later on, and which, for want of a better term, may be designated as *intermittent intubation*.

The most prominent and alarming symptom of diphtheria or croupous laryngitis, the stenosis occasioned by the exudation, is quickly, certainly, and effectually relieved by the insertion of an O'Dwyer's tube. If the membrane be limited to the larynx, the disease being local in character, without septic or other complication, recovery is probable. Unfortunately, these cases form but a minority of those met with in practice, and the prognosis frequently is rendered uncertain and grave by an extension of the membrane downward into the larger bronchi and their ramifications. Though the dyspnoea due to the process in the larynx may be relieved by intubation or tracheotomy, suffocation under these circumstances takes place in consequence of bronchial stenosis. When this accident occurs after tracheotomy, we attempt to soften or remove the membrane by instillations of carbolic oil, glycerin, lime-water, and other solvents, inhalations and topical applications of various kinds, and the use of feathers, forceps, catheters, aspirations, etc.

In an elaborate article which has appeared recently in the *Archiv für Kinderheilkunde*, Band x., Heft i., "Upon the Treatment of Secondary Attacks of Asphyxia after Tracheotomy for Croup," Pieniazek cites a number of cases in which recurring attacks of suffocation threatening life, and caused by false membrane in bronchi, were relieved by the use of modified Schrotter's forceps, catheters, bronchial scoops, artificial respirations, etc. In some cases the position of the membrane was ascertained by inspection with a mirror through the tracheal opening.

Such unremitting attention in the after-treatment of these cases, requiring the constant attendance of the physician to act promptly upon the first appearance of any symptoms of asphyxia, is not always possible in practice. When intubation is resorted to, and the membrane extends downward, we cannot avail ourselves of the measures referred to above to the same extent as after a tracheotomy; and in my later cases, when I have had reason to suspect the presence of membrane low down, I have put into practise a plan, which may be

termed "intermittent intubation," and which will be referred to more in detail in a moment.

In reviewing the reports of intubation, one is struck by the frequency with which the tube is coughed out, particularly if smaller in size than adapted to the age of the child. Though the expulsion of the tube by coughing has been regarded as a decided objection, we find upon closer examination that in these instances the presence of the tube, even for a short time, modifies the local condition in the larynx, and when the tube is spontaneously expelled by coughing, the dyspnœa is usually relieved for a number of hours, and in one case, which came under my observation, four days elapsed before the obstruction recurred to such an extent as to require the reinsertion of the tube. I have said spontaneously expelled by coughing, and I lay stress upon this, for we do not get the same remission in the symptoms when the tube is removed by the physician after having been *in situ* for a similar time. The life of the patient is not compromised, for there is ample time to interfere before the urgent symptoms reappear, and, as long as the breathing remains unobstructed, we may wait before reinserting the tube.

It is advisable in all cases to explain this to the attendants, and thereby avoid unnecessary alarm and calls at inopportune moments.

Impressed by the importance of this circumstance, I concluded to utilize it in practice, and therefore have resorted to the use of a smaller tube, in order that it might be more readily expelled by coughing, particularly in such instances in which the symptoms would lead one to suspect the presence of membrane in the bronchi. To state it briefly, so as not to be misunderstood, the smaller tube relieves the dyspnœa just as effectually as a larger one, but it will be more readily expelled by coughing, and, as the breathing is usually easier for a considerable time after the spontaneous expulsion of a tube, life is not endangered, for there is sufficient time at our disposal to interfere when urgent symptoms arise. The advantages presented by the method of intermittent intubation are well shown in the following case:

Female; three years old; diphtheritic deposits upon the tonsils; three days later the larynx became involved, and

some fifty hours afterwards cyanosis was marked; child extremely restless; the retraction above and below the sternum moderate. Intubation was now performed, membrane and considerable mucus being expelled. The breathing quieted and the cyanosis disappeared.

In view of the extreme dyspnoea and restlessness, with moderate retraction of the soft parts, I concluded that the trachea and bronchi, as well as the larynx, were involved. A two- (2) year tube, instead of the larger one, was accordingly employed, in the hope that as soon as the membrane became loose the tube and membrane would be expelled together. My anticipations were realized, and about twelve hours later the tube and membrane were coughed out. A few hours later the tube was introduced (second time), retained for twelve hours, and then expelled with a large cast (March 4). The breathing continued good until about 9 P.M., when tube was inserted (third time). Coughed out at 3 A.M. (March 5); cast again thrown off. Breathing continued fair until 10 A.M. (March 6). Tube inserted (fourth time) and retained for twelve hours, when again expelled, membrane following. March 7, 7.30 A.M., fifth intubation; relief; expulsion of tube and cast at 9 P.M. March 8, sixth intubation; retained until 5 A.M. next day. March 9, 10.30 A.M., seventh intubation; relief. In the evening the breathing again obstructed. Brandy and water was then ordered in frequent doses, causing expulsion of tube, occluded by a cast which, from its branched appearance, evidently had come from some of the smaller bronchi. It was firmly impacted, some force being required to remove it from the tube. The breathing remained free, though the respirations were accelerated in consequence of pneumonia and nephritis. No further asphyxia occurred, and the child seemed to be doing nicely.

Died suddenly of heart failure, March 14, four and a half days after expulsion of last cast. No autopsy.

Though the case terminated fatally, the lesson taught is important. Each insertion of the tube rescued the child from impending suffocation and transformed its condition into one of comparative ease and comfort. The relief was so great that as soon as the dyspnoea recurred the little one would ask for

the tube. The use of the smaller tube, and its subsequent expulsion with membranes, afforded relief in a very bad case, and for periods varying from five to twenty-seven hours the child did not wear the tube. During these intervals considerable nourishment was taken. The danger of asphyxia from occlusion of the tube by loose membrane, which, as shown by reported cases, is not theoretical, was avoided. When ejected for the seventh time the tube was found to be occluded, and some force was required to remove the membrane. I have resorted to this plan in other instances with favorable results. Though other cases might be cited, I shall refer particularly to Cases LXIX. and LXXXV.

CASE LXIX.—M.; two years four months. Tube coughed out with cast four hours later. The breathing remained good until next morning; then tube inserted for the second time. Eight hours later the tube was coughed up for the second time, cast again being thrown off. Fourteen hours later third introduction of the tube; retained for thirty-six hours, and then coughed out with more membrane. The breathing, still somewhat obstructed for some time, gradually improved, and the child recovered.

CASE LXXXV.—F.; three years four months. The tube on the first occasion was retained for six hours, then expelled with a cast; four hours later it was reinserted, and after ten hours was ejected together with a second cast. The condition remained fair for four days, when an increase in the dyspnoea forced me to intubate for the third time. The tube was retained for twenty-three hours and then thrown out with another cast. The further progress was favorable.

When a smaller tube is employed the after-treatment is more irksome, but the advantages attained more than counterbalance the disadvantages. If the tube be ejected several times within a few hours we cannot avail ourselves of this method, but are then forced to insert the larger tube.

If the case progresses favorably the tube ordinarily may be removed on the fourth or fifth day. In case the dyspnoea recurs, in all instances it is well to be prepared to reintubate at once; a smaller tube may be used, the advantage being that it will in all probability be coughed out after a time, and then

the obstruction will have disappeared completely or be relieved to such an extent as not to occasion any further alarm. Under these circumstances the recurring stenosis is to be attributed probably to a spasm due possibly to the irritation of the inspired air, or perhaps it may be the result of some slight injury to the parts by the finger or extractor. Thus, in Case LXXXIII. the tube was taken out on the fifth day; within a half-hour the dyspnœa became more and more pronounced, and in the opinion of Dr. H. M. Silver and myself reintubation was necessary. I therefore inserted a smaller tube, expecting that as soon as it was coughed out the breathing would be freer; next morning it was ejected, and the respiration was found to be free from obstruction.

In a small proportion of the cases the retention of the tube for a comparatively short time (being expelled spontaneously) has been found to be sufficient to tide the patient over the period of greatest danger. Thus, in Case XCIII. the tube was retained but fifteen hours; in Case XCI., thirty-six hours; and in Case LXV., forty-eight hours.

It may be argued that these patients would have recovered without operation. In reply, I can only say that the symptoms presented were as marked as in instances in which the tubes were retained for longer periods. Furthermore, it is not possible to tell beforehand in which case this fortunate result may be attained. The most plausible explanation, I presume, is the following: the tube and cast being expelled together, no subsequent formation of membrane occurred to cause a renewal of the obstruction.

On the other hand, exceptional cases are met with in which the tube may be necessary for several weeks. Case LXIII.—M.; twenty-six months old; an exceedingly nervous, excitable, and hysterical patient (parents equally so)—wore the tube for sixteen days. When taken out on the fifth and twelfth days the stenosis returned within a short time, and the distress was so great that I was forced to reinsert the tube. On the sixteenth day it was expelled spontaneously, and the breathing remained free from this time on.

In two cases of primary intubation membrane was forced down in considerable quantities. The first has already been

reported. The second (Case XCIV.) was hopeless at the outset. The child was markedly cyanosed, and the cough had ceased for several hours. As soon as the tube was inserted the child became black; the tube was taken out at once, and the administration of brandy, with a resort to artificial respiration, caused the expulsion of a cast three inches long. The breathing improved somewhat; next morning, however, the dyspnœa recurred, and death took place a few hours later. In none of my cases of secondary intubation did this accident occur.

The œdematous epiglottis and ary-epiglottic folds may overlap the upper portion of the tube to such an extent as to produce serious obstruction to respiration in exceptional instances. A case in which this accident was encountered occurred in the practice of Dr. Volkenberg. The patient, a boy of four years, had been intubated several days before. The child progressed favorably until the fourth day, when a recurrence of the dyspnœa and croupy breathing after a severe spell of cough and vomiting led to the suspicion that the tube had escaped from the larynx. As the gentleman who had intubated in the first instance was out of town, I was called, and found marked retraction, dyspnœa, and restlessness; *the cough, however, was loose* and not croupy. An attempt was then made to insert another tube, and only then did I discover that the first tube was still in the larynx, the head being well covered by the œdematous ary-epiglottic folds. After some difficulty the tube was removed, the flanged portion being directed forward. The same tube was reinserted with the flange backward; the croupy breathing and dyspnœa disappeared at once, and the child eventually recovered.

It may, perhaps, be well to refer for a moment to the medico-legal complication which occurred in one of the cases. A patient of Dr. F. Nordeman was intubated at the request of Dr. Horn, who had been called in the emergency. The child progressed favorably after the operation, and the prognosis appeared good. On the fourth day death took place suddenly. On attempting to remove the tube after death we found that it had disappeared from the larynx, and a careful search of the apartment failed to lead to its discovery. According to the doctor, the tube had been *in situ* but a few hours before, and as

the child had a severe vomiting spell late in the afternoon, it was supposed to have been coughed up and swallowed or thrown out with the vomited matter. The following morning Dr. Horn received the following threatening letter:

"NEW YORK, Febr. 18-87.

"Dr. John Horn

"Dear Sir

"In consequence to death of the little child by putting in the Tube which I believe that the child choked only throu that, I want you to take that out; I dont want to have that child berried with that Tube. And if you dont take it out, I will be bond to make a complain to the Koroner against you. You must to take that out the same way as you putted it in

"By doing so you will oblige Yours truly

"J. L.

"LMR."

Fortunately the death-certificate had not been granted, and the doctor at once turned the case over to the proper authorities. A careful autopsy, legally conducted, failed to reveal the tube in the larynx, trachea, oesophagus, stomach, or intestines. Subsequently we learned that the tube had been coughed out and melted, being supposed to be pure gold. We further were informed that the child, feeling quite well, had been allowed to sit on a high-chair at the table; had fallen, striking its head; and was then seized with a convulsion, in which it died. The resolute stand taken by Dr. Horn had effectually check-mated the blackmailing scheme. A charity case at that!

Conclusions.—As the result of my experience in the treatment of croup or diphtheritic laryngitis requiring operation, I would maintain that intubation and the internal use of the bichloride of mercury yield thus far the best prognosis.

The difficulty in feeding (the strongest and most valid objection to the method) may be overcome in great measure by the employment of a trained nurse, personal supervision on the part of the physician (the idiosyncrasies of each patient as regards the ability to swallow liquids being carefully studied),

the use of solid and semi-solid nourishment, rectal or forced feeding through the stomach-tube per mouth or nares, and intermittent intubation.

If the symptoms in a case lead us to believe that the trouble is localized in the larynx and trachea a full-sized tube should be inserted. A smaller tube may be inserted (with a view to being coughed out after a variable period of time) when membrane is suspected in the bronchi or to relieve the recurring dyspnœa occurring in some cases upon the removal of the larger tube at the fourth, fifth, or sixth day.

Intermittent intubation offers the following advantages: Food, medicines, and stimulants may be administered in the interval. If membrane exist or be loose below the tube, there is less danger of occlusion, for the tube is readily coughed out and with it the membrane. The time of wearing the tube is materially shortened. The spasm which sometimes occurs when the larger tube is removed on the fourth to the sixth day is relieved by the insertion of a smaller tube, and when the latter is coughed out (usually in from six to twenty hours) the patient will be found to breathe without difficulty.

My deductions are not theoretical or imaginary, but are based upon numerous and careful observations, verified in a number of cases. It is true that intermittent intubation has been advocated before, but the plan proposed differed from the course pursued above, in that the tubes (full sized) were removed at intervals and reinserted after the child had been fed. Dr. O'Dwyer, in detailing his second series of cases, incidentally refers to the advantages afforded by employing smaller tubes in certain cases. My own investigations in this respect were conducted without a knowledge of what had been accomplished by the doctor. I do not, however, bring this forward to claim undue credit, for his results were published some time ago. I rest content to follow in his footsteps, to contribute my mite here to the amelioration of the sufferings of the little ones afflicted with such a dreaded and fatal affection as diphtheritic croup.

Second Series of Forty-seven Cases.

No.	By courtesy of or seen by	Sex.	Age.	Duration of		Urine.	Cause of Death.	Complication.	Tube removed.	Result.	Remarks.
				Laryngeal.	Pharyngeal or nasal diphtheria.						
48.	Dr. F. Bennett.....	F.	20 mos.	2 days.	Heart-failure.	Pneumonia.	Death 20 hrs. later.	Tube coughed out in 48 hours, up twice during first 48 hours; 3-4 then inserted and retained. Tube coughed out at end of 3 days.
49.	Dr. J. Baran.....	F.	4 1/2 yrs.	3 days.	6 days.	.....	.....	.....	.....	Recovery (1).
50.	Dr. H. Locwenthal..	M.	2 1/2 yrs.	3 days.	.....	.....	.....	.....	5 1/4 days.	Recovery (2).
51.	Dr. A. W. Newfield..	F.	20 mos.	2 1/2 days.	5 days.	Recovery (3).	Tube coughed out at end of 48 hours.
52.	Dr. A. W. Newfield..	M.	4 years.	2 days.	.....	.....	.....	.....	.....	Recovery (4).
53.	Dr. Schlessinger.....	F.	20 mos.	3 days.	5 days.	.....	Pneumonia.	.....	.....	Death 2 days later.
54.	Dr. A. W. Newfield..	M.	20 mos.	4 days.	Pneumonia.	Pneumonia.	Death 36 hrs. later.	Tube coughed out after 36 hours. Reintroduced a few hours later, and again coughed out at end of 5th day.
55.	Dr. Mohner.....	F.	7 years.	3 days.	.....	Albumen.	.....	.....	.....	Recovery (5).
56.	Dr. F. Bennett.....	.....	20 mos.	3 days.	.....	.....	.....	Pneumonia.	.....	Death 3 days later.
57.	Dr. Berlinger.....	F.	5 years.	2 1/2 days.	Albumen.	Exhaustion.	8th day.	Death 12 hrs. after removal of tube.	2-years' tube inserted; complete relief; coughed out in 5 hours; reintroduced 7 hours later, and retained again for 5 hours; larger tube inserted; relief.
58.	Dr. W. A. Haynes...	F.	5 years.	2 days.	.....	.....	Extension of membrane into bronchi.	Pneumonia.	.....	Death 18 hrs. later.
59.	.....	F.	3 years.	.....	.....	Albumen.	Nephritis and extension of membrane downward.	.....	.....	Death 3 days later.

60.	Dr. Mohet.....	M.	4 years.	4 days.	Albumen.	.....	.....	8th day.	Recovery (6). It recovery (7).	Tube coughed out after 28 hours, and though symptoms threatening for following 36 hours, not necessary to reintubate. Breathing excellent for 2½ days, then extension of membrane downward.
61.	Dr. Denhard present.	M.	3½ yrs.	3 days.	.....	.....	.....	.....	.....	.....
62.	Dr. Coughlin.....	F.	3 years.	2 days.	.....	Extension of membrane.	.....	.....	Death 3 days later.	.....
63.	Dr. G. W. Teschner.	M.	26 mos.	4 days.	.....	.....	.....	.....	Recovery (8).	Removed tube on 5th and 12th days; coughed out on 16th day. A very nervous and hysterical patient.
64.	Dr. M. J. Messemmer.	M.	4 years.	3 days.	.....	Sepsis.	.....	.....	Death 3 days later.	.....
65.	Dr. F. Bennett.....	F.	7 years.	3 days.	.....	Extension of membrane.	.....	.....	Recovery (9).	.....
66.	Dr. A. W. Newfield.	M.	9 years.	2 days.	.....	Extension of membrane and ex-haustion.	.....	.....	Death 26 hrs. later.	.....
67.	Dr. Markiewicz.....	M.	14 mos.	3 days.	.....	Extension of membrane and pneumonia.	Pneumonia.	.....	Death on 10th day.	Removed tube on 6th day.
68.	Dr. Blossy.....	F.	6 years.	3 days.	.....	.....	.....	.....	Death 48 hrs. later.	.....
69.	Dr. O. J. Ward.....	M.	2 years 4 mos.	3 days.	Albumen.	.....	.....	.....	Recovery (10).	.....
70.	Dr. Denhard pres- ent.	F.	14 mos.	3 days.	.....	.....	.....	6th day.	Recovery (11).	.....
71.	.....	F.	4 years.	.....	.....	.....	.....	.....	Death 4 hrs. later.	.....
						

Tube coughed out with cast 4 hours later; breathing good until next morning; then inserted tube again; coughed up 8 hours later, cast following; breathing good for 14 hours, after which interval it was necessary to introduce tube for third time; this time retained for 36 hours, and then coughed up again; more membrane; breathing somewhat obstructed, but not necessary to reintubate.

Second Series of Forty-seven Cases—Continued.

No.	By courtesy of or seen by	Sex.	Age.	Duration of		Urine.	Cause of Death.	Complication.	Tube removed.	Result.	Remarks.
				Laryngeal.	Pharyngeal or nasal diphtheria.						
72.	Dr. McNamara.....	F.	4 years.	Heart failure.	Measles.	Death 4 days later.	Patient cyanotic; pulse intermittent; tube coughed out at end of 6 hours; reinserted 2 hours later, and remained <i>in situ</i> for 4 days; then coughed out again.
73.	Dr. L. Kohn.....	M.	6 mos.	6 days.	.....	.....	Heart failure.	.....	.....	Death $3\frac{1}{2}$ days later.
74.	Dr. H. Loewenthal..	M.	11 years.	3 days.	.....	Albumen.	.....	.....	.....	Recovery (12).
75.	Dr. Molner.....	F.	20 mos.	3 days.	Extension of membrane.	Death 14 hrs. later.	Patient cyanotic; pulse intermittent; tube coughed out at end of 6 hours; reinserted 2 hours later, and remained <i>in situ</i> for 4 days; then coughed out again.
76.	Dr. Holden.....	F.	3 years.	2 days.	.....	.....	.....	.....	6th day.	Recovery (13).
77.	.....	M.	20 mos.	36 hours.	.....	.....	.....	Measles.	.....	Death 20 hrs. later.
78.	M.	3 years.	Pneumonia and extension of membrane.	Measles.	Patient cyanotic; pulse intermittent; tube coughed out at end of 6 hours; reinserted 2 hours later, and remained <i>in situ</i> for 4 days; then coughed out again.
79.	.....	F.	3 years.	3 days.	6 days.	Albumen.	Pneumonia, extension of membrane, and nephritis.	.....	6th day.	Death on 10th day.
80.	Dr. Berlinger.....	F.	5 years.	2½ days.	5 days.	.....	Extension of membrane.	.....	.....	Death 24 hrs. later.
81.	Dr. F. Bennet.....	M.	1 year.	2½ days.	Membrane in bronchi.	Death 36 hrs. later.	Tube removed on 5th day; smaller one inserted and coughed up next day.
82.	Dr. Brunner.....	F.	22 mos.	2 days.	.....	.....	Membrane in bronchi.	.....	.....	Death 36 hrs. later.
83.	Dr. Berlinger.....	M.	3 years 4 mos.	2½ days.	.....	Albumen.	.....	.....	.....	Recovery (14).

84.	.....	M.	5 years.	3 days.	.....	.....	Pneumonia and extension of membrane.	.....	.....	Death 24 hrs. later.	
85.	Dr. Hill.....	F.	3 years 4 mos.	3 days.	5 days.	.....	.....	.....	.....	Recovery (15).	Tube retained for 6 hours, then coughed out with cast; 4 hours later reinserted; coughed out in 10 hours (cast following); condition fair for 4 days, when increased dyspnea necessitated reintubation; retained for 23 hours, and then coughed out; not necessary to insert again.
86.	Dr. G. W. Teschner..	F.	5 years.	2 days.	.....	.....	Heart-failure.	.....	.....	Death 24 hrs. later.	
87.	Dr. Markiewicz.....	F.	2 years 3 mos.	2 days.	.....	.....	Pneumonia and extension of membrane.	.....	.....	Death 48 hrs. later.	
88.	Dr. Margolies.....	M.	3 years.	2 days.	.....	.....	Heart-failure.	.....	.....	Death 48 hrs. later.	
89.	Dr. Kalischer.....	F.	3 y. 8 m.	3 days.	.....	.....	Sepsis.	.....	5th day.	Recovery (16).	
90.	Dr. Naughton.....	M.	4 years.	3 days.	.....	.....	.....	.....	.....	Death 30 hrs. later.	
91.	Dr. Berlinget.....	M.	20 mos.	2½ days.	.....	.....	Pneumonia and membrane in bronchi.	.....	.....	Recovery (17).	Tube coughed out at end of 36 hours.
92.	Dr. Berlinget.....	M.	2 years 8 mos.	3 days.	.....	.....	.....	.....	.....	Death 4 days later.	
93.	Dr. Janes.....	M.	14 mos.	2½ days.	.....	.....	Pneumonia.	.....	.....	Recovery (18).	Tube coughed out at end of 15 hours.
94.	Dr. Margolies.....	F.	2 years.	3 days.	.....	.....	Pneumonia and membrane in bronchi.	.....	.....	Death 12 hrs. later.	Membrane forced down by tube; the latter removed at once and brandy administered, followed by cough and expectation of large casts; breathing easier for few hours, then recurrence of dyspnea.

CHICAGO, November 26, 1888.

EDITOR OF THE ARCHIVES OF PEDIATRICS:

IN the October, 1888, issue of your journal, on page 601, in an article by Dr. J. Mount Bleyer, of New York, is a description of an improved "cupped and false epiglottis tube" that is misleading, as one would infer from reading the article that Dr. Bleyer originated the idea of substituting the "metal-hinged artificial epiglottis" for the soft-rubber epiglottis originally used by Professor T.E. Waxham. As a matter of fact, Professor Waxham abandoned the use of the rubber epiglottis nearly a year ago, and devised or invented a tube with "metal artificial epiglottis" as a substitute, and exhibited the improved tube to the members of the Chicago Medical Society, February 20, 1888, and it was illustrated in the *Journal of the American Medical Association*, March 24 of the present year. Priority in the use of this improved device to assist the patient in swallowing and to lessen the chances of the development of a broncho-pneumonia therefore belongs to Dr. Waxham.

D. A. K. STEELE.

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Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Adams, M. A.: The Infection of Scarlatina. (*Lancet*, July 14, 1888.)

In recording his experiences for the past year, Mr. M. A. Adams, the medical officer of health for Maidstone, expresses his belief that even in the mildest forms of scarlatina the duration of infection is at times very prolonged.

On several occasions Mr. Adams has known the disease to be communicated by a convalescent who retained no obvious signs of ill health or infection as late as the forty-third day, and, in his opinion, the infection has in such cases been communicated by the act of kissing. He would therefore make it a rule to maintain isolation for a minimum period of seven weeks, and even then to give a caution against the habit of

kissing. The retention of infection about the fauces for prolonged periods is well known to take place in the case of diphtheria, and it is possibly at times the same in scarlatina, even when no obvious indications of any throat affection remain. There are, however, cases in which patients returning from hospital have been credited with conveying infection, when it is much more likely that the mischief has been induced by the bringing out of clothing which the patient wore a few days before being isolated and which escaped disinfection.

Money, Angel: The Treatment of Broncho-Pneumonia in Children by Application of Ice. (*Lancet*, June 2, 1888).

The cause of the broncho-pneumonia does not influence the employment of the ice-bag. The smaller the child the more marked are its effects. As a rule, the rectal temperature affords the best guide to the application of cold. Instead of ice-bags, Leiter's tubes may be used. The condensation of moisture caused by the cold is, of course, inevitable; but this wetting may be rendered harmless by covering the ice-bag or Leiter's tubing with a layer of wood-wool or similar substance. In severe cases, where a rapid effect is desired, two ice-bags have been placed on the head and one over the seat of chief consolidation in the lungs. With a little management it is not difficult to keep these in place.

The chief merits of this treatment consist in the maintenance of the strength, not only of the heart, but also of the respiratory centres and of the nervous and muscular systems.

Albuminuria is not rendered worse by the cold, nor have any cases of hæmaturia been observed. The duration of the disease is shortened and convalescence rendered more rapid because of the conservation of the child's energy. Ice does not act merely by removing heat; its action is almost exclusively sedative. Ice influences different organs differently, and this is most noticeable in the various parts of the nervous system. Its action on the cortex of the brain is, perhaps, most evident in the production of sleep, restless movements rapidly subsiding if the cold be efficiently applied; probably, therefore, the whole system of motor centres and sensory centres is soothed, because morbid sensations and morbid motions tend to cease.

Cold directly quiets the heart and steadies the circulation, and it is also probable that, calming the nervous system, it acts indirectly in the same direction. The respiratory centres are similarly beneficially affected. The heat-regulating apparatus manifests the same beneficent action, and the temperature chart shows a similar harmonious effect. After the

application of ice to any part of the body there is an immediate cooling of the whole surface of the body. The cooling effect is best marked when the ice is applied to the head.

Vomiting and diarrhœa may require treatment. The cold method does not increase diarrhœa, and it certainly tends to stave off vomiting.

The employment of cold does not obviate the necessity of using stimulants, but it renders them less necessary, and when they are required smaller doses are sufficient.

Dr. Money considers that there is a saving all around in treating broncho-pneumonia by this method.

Pfeiffer: (1) A New Parasite in Smallpox of the Sporozoa Species. (2) Parasites in the Contents of the Vesicles of Varicella and Herpes Zoster, and their relations to Similar Parasites in Smallpox. (3) The Existence of Marchiafava's Plasmodine in the Blood of Vaccinated Persons and those Sick with Scarlatina. (*Jahrb. f. K.*, xxviii. 2.)

The author of these three papers has called attention to animal parasites of the lowest order, which he has constantly found in the contents of the pustules of vaccinia and variola, in the vesicles of herpes zoster and varicella, and in the blood of vaccinated persons and those who were sick with scarlatina. The discovery and first description of these forms in the blood were made by Laveran, who first recognized them in malarial subjects in Algiers. These investigations were confirmed and extended by Marchiafava and Celli, in Italy, and quite recently similar results have attended investigations in malarial regions in America. Pfeiffer was also preceded in his discovery of these protozoa in the lymph by A. van der Loeff, who worked in Forster's laboratory, and found in animal vaccine a rhizopod which closely resembled vaccine virus. The parasite which was first found by Pfeiffer in the contents of vaccinia pustules was a single-celled protozoon twenty to thirty micromillimetres in diameter. It had amœboid movements early in its existence, and in the course of its development broke through its capsular covering, and gradually surrounded itself with another. Proliferation was accomplished by means of spores, which were formed in the capsule, the spores giving rise to an amœba-like embryonal body with weak powers of motion, which accomplished the same cycle of development as its parent. This parasite was found in human smallpox, in cowpox, and in the pox produced by animal vaccine in the dog, cow, horse, hog, and goat. It was not communicable to pigeons and chickens. It was found in small numbers in the lymph of the pustules,

and constantly and in larger numbers in the papillæ of the rete Malpighii, sometimes arranged in thick layers, and sometimes in the interior of the epithelial cells. The further study of the development and meaning of this parasite was interfered with, as it could not be cultivated on a solid medium, and no opinion was offered as to its significance in connection with the morbid process in smallpox, further than to note that it was constantly present. Similar microbes were found in the vesicles of six persons sick with herpes zoster, but they were not inoculable. A similar protozoon was also found in varicella vesicles, thirty cases being investigated. Similar parasites were found in the blood of children who had been vaccinated, and in those who had been sick with scarlatina and parotitis. They occurred in the red corpuscles, and were similar to the *plasmodium malarie* of Marchiafava and Celli. They were vacuolated, amœboid, and susceptible to staining, and occasionally there were nuclei or pigment-granules within the limits of the corpuscles. These investigations of blood and vesicle contents were made by the medium of pendent drops of bouillon and on heated object stages.

A. F. C.

Penzoldt: Some Experiments in transmitting Diphtheria to Animals. (*Jahrb. f. K.*, xxviii. 2.)

All experiments which have thus far been made upon animals, and even upon man, for the purpose of transmitting diphtheria by inoculation have failed, in that they have not succeeded in producing, by a definite way of transmission, constant pathological changes; or in other words, they have not produced in animals a process which is identical with human diphtheria. The failure can be attributed to the fact that none of the species of animals which was experimented with was constantly and uniformly susceptible to the contagium of the disease, or to the fact that the inoculating material was not active, or to the fact that the method of treatment and the site of application were not well chosen. The whole question is faced by the great objection that the exciting cause of true diphtheria has not yet been discovered, for the Löffler bacilli have not been demonstrated to be the cause. The experiments of the author, which, for the most part, yielded negative results, were as follows:

1. Transmission of freshly-removed membrane from living human beings to animals, the mucous membrane of the latter being first touched with a hot knife, after which the membrane was placed upon it. In guinea-pigs and pigeons thus experimented with only one application to the wounded mucous membrane was successful.

2. Micro-organisms removed from such layers were cultivated, and with the cultures experiments in transmission were made, with two different forms of spore. In no cases did diphtheritic processes arise upon the mucous membranes which resembled human diphtheria.

3. Micro-organisms were taken from freshly-removed false membrane, and transmission experiments were made with them. No positive results were obtained. A gelatin and a serum culture yielded changes resembling those of diphtheria on the conjunctiva, trachea, and larynx, but true diphtheria was not developed.

4. Cultivation of micro-organisms obtained from the blood of those who had died from diphtheria, and transmission experiments were also negative. From the blood obtained from two persons who had died of diphtheria an identical bacillus was cultivated, but the results obtained with it upon animals did not justify a conclusion that true diphtheria had been obtained. The opinion is advanced that diphtheria, clinically, is not always due to the same exciting cause; if this be true the anatomical process must also vary.

A. F. C.

Fervors: The Treatment of Whooping-Cough with Quinine, particularly by Injection. (*Jahrb. f. K.*, xxviii. 2.)

Notwithstanding the great variety of remedies which has been suggested for whooping-cough, a perfectly satisfactory one is yet to be discovered. According to Hagenbach, the mortality from this disease of children under one year is 26 per cent. of all cases, under two years, or from the first to the second year, 13.8, from the second to the fifth year 3, from the fifth to the fifteenth 1.8. As to its pathogenesis, all recent authors agree that this is one of the infectious diseases, with the contagious element which characterizes such diseases. The germ or spore which produces whooping-cough has not yet been satisfactorily demonstrated. The seat of the disease may be in the centre for coughing in the spinal cord, which has been influenced by a specific poison circulating in the blood, so that a slight peripheral irritation of the sensory fibres will excite paroxysms of coughing, or the cause may lie in the irritable and readily conducting sensory nerves of the mucous membrane, and in a virus localized on certain portions of the respiratory mucous membrane. All the recent investigations as to the nature of the disease have succeeded in showing only that it is an infectious disease and that it is caused by pathogenic organisms. The treatment of the disease with quinine began in 1868 with Binz, and since that time it has been tried and recommended by Jensen, Steffen, Rindfleisch, Keating, and many others.

Its beneficial effect is due, according to some, to its tendency to diminish the reflex excitability of the spinal cord, while others consider that it is efficient only on account of its antizymotic properties. It will not cure every case of the disease, just as it fails in some cases of malaria. Often it is given in too small doses, for children can bear relatively larger doses than adults. Often, too, it is not given for a sufficiently long time to test its merits. The more quickly it is absorbed the better will be the results. With this principle in view the author has found the tannate a very useful preparation. Theoretically, subcutaneous injections must form the most favorable method for using the drug if a combination were at hand which would admit of ready absorption. Such a combination seems to be furnished by the carbamide of quinine, which is a crystalline combination of the acid muriate of quinine with chemically pure urea, and is soluble in an equal portion of water. A. Jacobi obtained very satisfactory results with hypodermic injections of this salt. The author also used it in a series of cases and was satisfied with the results. In some cases the results were remarkably good. His experience taught him, however, that injections should not be made with concentrated solutions, neither should too large a quantity of a dilute solution be used. This method of treatment is recommended only for those cases which cannot be satisfactorily treated by capsules, tablets, etc., by the mouth, or by rectal injections. With suitable care the danger of abscess or necrosis of the skin by this method is not great; but at any rate, considering the advantages of the treatment, it would be the lesser of two evils. A salt of quinine is desirable, which is even more soluble than the carbamide and not so readily broken up in alkaline tissues.

A. F. C.

II.—MEDICINE.

Murray: Case of Congenital Heart-Disease in an Adult. (*Lancet*, May 5, 1888.)

Dr. H. Montague Murray showed a specimen of a patent ductus arteriosus in a woman who died, aged thirty-six, of malignant endocarditis. During life there was a systolic thrill over the pulmonary cartilage and a systolic bruit heard loudest at the same place. At the post-mortem the heart weighed eighteen ounces, the hypertrophy being chiefly on the left side, and vegetations were found on all the valves. The ductus arteriosus was patent, about three-eighths of an inch in length, and large enough to admit a quill. A large mass of vegetations was found near the opening of the duct in the pulmonary artery.

The position of the vegetations, the dilatation of the pulmonary artery, the absence of cyanosis before death, and the position of the murmur and thrill seemed to show that blood passed from the aorta into the pulmonary artery; while the absence of any marked hypertrophy of the right ventricle showed that it caused but little obstruction.

Hillyer: Infantile Pulmonary Syphilis. (*Lancet*, May 5, 1888.)

Dr. Arnold Hillyer (*Fortsch. d. Med.*, No. 8) describes two forms of lung-disease in congenital syphilis,—viz., (1) white pneumonia and (2) interstitial pneumonia. The first is very rare, and only occurs in the still-born or in those who survive birth a very short time. The lungs are voluminous and bear the impress of the ribs, and have a whitish or marbled aspect. The alveoli are filled with fattily-degenerated epithelium and the alveolar spots are not thickened.

The second variety is met with in all degrees, occasionally so slightly marked and limited to the vicinity of the vessels and bronchi as to be hardly recognized, were it not for the coexistence of other evidence of syphilis. In marked cases the lungs are large, tough, but air-containing. They may be entirely or only in part affected. The interstitial tissue is greatly increased by new connective-tissue or round cells; the capillaries dilated and tortuous; but no endarteritis has been observed.

The right side of the heart is often notably hypertrophied. The disease begins in foetal life, and may attain a considerable extent before it proves fatal; or, being partial and slight, it may not terminate life; but it may extend at a later period. It is suggested that some of the cases of pulmonary induration met with in adult life and inexplicable on other grounds are to be referred to such inherited lesions. Hillyer has never met with tuberculosis in association with these syphilitic diseases.

Corminas: Disappearance of Hypertrophy of the Tonsils in Scarlatina. (*Lancet*, June 23, 1888.)

Dr. D. E. Corminas relates, in a Barcelona medical journal, the case of a little girl, nine years of age, who suffered from very great enlargement of the tonsils, which had been increasing for some years. Last winter, however, she was attacked by scarlatina, which was accompanied by an alarming amount of throat affection. On the fourth day it was found that the tonsillar enlargement had entirely disappeared. The little patient made a good recovery. Here the scarlatinal process

produced a more complete cure than any caustic or removal by the knife could have done, the fossæ behind the pillars of the fauces appearing perfectly normal. A somewhat similar case, in which diphtheria had destroyed hypertrophied tonsils, was reported some time ago in the *Revista de Ciencias Médicas* by Dr. Simonena.

Case of Uræmic Convulsions following Post-Scarlatinal Nephritis. (*Lancet*, July 14, 1888.)

This case illustrates that even when the greatest care is taken post-scarlatinal dropsy may occur, and also that even in the apparently most hopeless cases recovery may take place.

The patient had suffered from scarlet fever. Fourteen days after the rash had disappeared œdema of the eyelids and hands was observed. There was considerable blood in the urine. In spite of all the usual treatment he was seized with a convulsive fit on the fourth day. For this he was treated with pilocarpine. After consultation it was decided to try venesection. The median basilic vein was opened, but so altered was the blood and so weak the circulation that only a few drops could be made to escape; the incision was covered up and the boy was left to die. Next morning, however, he was sitting up laughing and chatting with his brothers. If a free flow of blood had been obtained venesection would have been accredited with the cure.

The moral to be drawn is obvious.

Barnes: Etiology of Diphtheria. (*British Medical Journal*, July 28, 1888.)

The author has carefully investigated fifty separate outbreaks of diphtheria, extending over a period of thirteen years. He has studied these outbreaks to discover if diphtheria may not arise from certain combinations of filth and unsanitary conditions independently of a pre-existing case of the disease.

The fact that diphtheria is more prevalent in rural districts than in more populous ones is explained by the want of suitable systems of drainage combined with filth in the form of decomposing animal matter,—conditions often found in small towns and thinly-settled communities.

A reference to the salient points connected with individual outbreaks, and to the elaborate tables prepared by the author, will show many interesting facts in regard to the dependence of diphtheria on filth.

The facts given tend to show that the germ flourishes outside the human body under certain conditions, and that it differs from other specific diseases which are propagated by

infection in that it may arise independently of a previously-existing case in a human subject.

The author's conclusions are as follows: 1. In the majority of instances no previous case can be found as the starting-point of each outbreak. It is easy when an outbreak has begun to follow almost every case and show how the contagion arose.

2. Diphtheria shows a regular yearly exacerbation during the winter months,—a time unfavorable to the development of low forms of animal or vegetable life.

3. That ordinary infectious diseases show much greater fatality in towns than in rural districts, which is not true of diphtheria.

4. In other specific diseases we never find an antecedent period of undeveloped disease, whereas in outbreaks of diphtheria it is not uncommon to find that sore throats have prevailed for some time previously which have not presented the true character of diphtheria. This points to a poison gradually developed rather than a specific germ.

Coutts, J. A.: Diphtheritic Paralysis after Slight Throat Symptoms. (*British Medical Journal*, July 14, 1888.)

In young children it is rare to obtain a history of diphtheria to account for the paralysis, instead of this being a rule. The complaint does not commonly follow what has been diagnosed as "diphtheria." In the author's experience at the East London Children's Hospital previous history as to recognized diphtheria was absent in all his cases. In most, however, a history of sore throat was obtainable. Under ten years the ratio between severity of throat symptoms and frequency of paralysis is an inverse one. The extreme infrequency of paralysis in cases of recovery from tracheotomy for diphtheria goes far to confirm this view. In adults the relative frequency of paralysis is much greater.

But all inquiries as to the frequency and severity of paralysis consequent on a previous diphtheria must be misleading until the question is settled as to what constitutes diphtheria. At present the author thinks that the only certain criterion of "diphtheria" is the presence of the paralysis.

Von Hoffmann-Wellenhof: Investigations concerning the Klebs-Löffler Bacillus of Diphtheria, and its Pathogenic Significance. (*Jahrb. f. K.*, xxviii. 2.)

The results of these laborious and praiseworthy undertakings were published in the transactions of the last meeting of the Association of Naturalists at Wiesbaden. From these it

appears that Löffler's pseudo-bacillus of diphtheria is very often found in the human pharyngeal cavity, and the author of this paper succeeded in finding it twenty-six times out of forty-five cases which were investigated. The true bacillus of diphtheria of Löffler showed very variable conditions as to its presence and its pathogenic character, being found in seven cases of pharyngeal diphtheria, in three cases of measles, in six out of nineteen investigated cases of pharyngitis complicating scarlatina, and in four out of eleven cases which had no perceptible abnormalities. Tests in regard to the virulence of cultures of these bacilli showed that a number of those which were obtained from diphtheritic as well as non-diphtheritic cases caused in animals the symptoms described by Löffler, while other cultures morphologically identical with the former were perfectly harmless in the experiments made upon animals. The age of the culture influences its virulence, inasmuch as cultures which are virulent at first lose that property to a great extent in the course of four weeks, while the daughter-cultures obtained from old cultures showed again their early high degree of virulence.

A. F. C.

Herz: Certain Nervous Affections in Children. (*Jahrb. f. K.*, xxviii. 2.)

In an attack of tetany one observes the characteristic position of the upper and lower extremities, the muscles of the neck, thorax, and abdomen also being sometimes involved. One also observes the characteristic effect of pressure upon the vessels leading to the affected part, also upon the muscles, and the increased electrical contractility. The cranial nerves, especially the facial, not infrequently participate in this condition. The duration in the author's cases was from one to ten days, as many as twenty paroxysms sometimes occurring in a single day. The sensorium, pulse, respiration, and patellar reflexes continued normal, and there was no fever. In the author's five cases the ages varied from two and one-half to eight months; three were boys and two girls; all had suffered from dyspepsia and intestinal catarrh, and were badly nourished. Clinical phenomena would indicate that the disease is due to anæmia of the cord, the latter easily reacting to slight stimulation and giving rise to tonic spasms. The prognosis in idiopathic tetany is good, if the disturbance of the respiration is not decided and there are no serious complicating diseases. The treatment should be aimed at the disease of the digestive canal and the anæmia, and the spasms should be treated with warm baths and subsequent warm wrappings.

In trismus and tetanus neonatorum the presence or absence

of high temperature has a decided bearing upon prognosis. The patient should be carefully nourished, mother's or asses' milk being introduced through the mouth or nose; chloral hydrate and Calabar extract being used at the time of the paroxysm. The former, in thirty-centigramme doses, may be given per rectum, and the latter, in six-milligramme doses, may be injected subcutaneously.

A. F. C.

Ringer: Measles occurring during the Course of Typhoid Fever. (*Lancet*, June 30, 1888.)

The following case is worth recording from the rarity with which accurate observations can be made of these two diseases running concurrently.

The patient, aged ten, had been ailing for fourteen days when she came under observation. In the house where she had been a brother had just had measles. The patient went through the usual course of typhoid fever,—presenting the symptoms in an almost typical manner.

At the end of the fourth week, when the patient's temperature was normal and while she was convalescing, there appeared a rash. There was an immediate rise of temperature. The rash was plainly that of measles. The symptoms now were those of measles, although there was no coryza. The rash gradually faded in a few days.

Remarks.—Cases of measles occurring during the course of typhoid fever are uncommon, and some think that the period of incubation and the subsequent course of the disease may be modified by this coincident affection. In the present case the period of incubation does not seem to have been shortened at all, for she must have brought the measles with her from home fourteen days before. There was no other apparent source of infection. The patient was singularly free from cough and coryza, and there was a slight modification of the rash on the body, but it was typical on the face.

The case was considered by all to be undoubtedly one of measles.

Parker, G. R.: A Case of Hydrophobia; Necropsy. (*Lancet*, June 16, 1888.)

A child, aged five, was bitten by a terrier. The bites received were on the face and five in number, only one requiring a suture. Nitric acid had been applied to these wounds. Two other boys were bitten by the same dog, and one of them had had his wounds treated with nitrate of silver. One week after the receipt of the injuries the three boys were sent to Pasteur.

Five weeks from the time they were bitten the one first mentioned began to be restless at night and to have difficulty in swallowing. He grew greatly excited; the eyelids were wide open and the pupils were widely dilated; the breathing was markedly shallow and irregular. He soon became unable to swallow at all. He had illusions. The temperature never went above 100°.

At the necropsy the spinal meninges were found congested and the spinal fluid increased in quantity. There were many old adhesions between the dura mater and skull; the brain-substance was congested; lateral ventricles empty. The pharynx and larynx were much congested.

A portion of the medulla sent to M. Roux, of the Pasteur Institute, was inoculated into rabbits and gave them rabies. The other children were in perfect health several months afterwards.

Pasteur considered the case of the child who died grave from the first, principally on account of the delay in sending the child to Paris, and also on account of the depth of the wound in the upper lip. He underwent thirty-three inoculations into the subcutaneous tissue of the iliac regions, alternate sides being selected each day.

Jacobi: Heart and Blood-Vessels in the Young. (*Brooklyn Med. Jour.*, March, 1888.)

The young infant (and child) has less blood in proportion to its entire weight; this blood has less fibrin, less salts, less hæmoglobulin (except the newly-born), less soluble albumen, less specific gravity, and more white blood corpuscles than the blood of advanced age.

Weber and Hewitt look for the explanation of many cases of icterus in the newly-born in the condition of the hepatic circulation. When the lungs are in a more or less atelectatic condition, the liver is in a state of passive congestion. Then the dilated vessels compress the biliary ducts. When the mass of blood circulating in the newly-born has been increased by pressing out the placenta, and applying the ligature late, jaundice will follow.

The function of the heart begins in the third week after conception. Its beats are very irregular at first, become soon regular, but remain very frequent until birth.

The writer was seldom mistaken in the prediction, based on Frankenhäuser's principle, of the sex of the child (that a foetal pulse, when nearer one hundred and twenty-four than one hundred and forty-four in a minute, belonged to a male child, and *vice versa*), provided the examination was made when the

pulse was not disturbed by causes due to changes in either the foetus or mother. According to Boyd, the proportion of the weight of the heart to that of the body exhibits no differences in the several ages, and the mechanical labor required to supply the body, or any part of it, with blood is therefore about the same in the young or old. Still there are differences.

The absolute and proportionate weight of the heart of the embryo is very great. As soon as the extensive circulation of the allantois ceases, the heart of the embryo increases rapidly. The increase in weight of the heart is mainly perceptible in the first half of embryonic life without any difference as to sex. This latter does not show its influence before the completion of the fifth year. The proportion of the heart to the rest of the body is largest about the time of birth, remains stationary for awhile, and takes a new start about the end of the second or during the third month. The increase in weight is mainly confined to the ventricles, for the auricles lose in proportion to the ventricles up to the period of completed development of the adolescent. In the embryo the muscular mass of the right auricle predominates over the left. From the beginning of the second month after birth, and during the whole of the first year, the right and left auricles are equal. After that time the right auricle continues to outrank the left, so that during and after puberty its weight is larger by five and five-tenths per cent. The equality of both auricles during infant life is due to the absence of great muscular exertions, and the renewed increase of the right auricle during later life to the effect of muscular action on the distribution of the blood.

The proportion of the size and weight of the heart to the body at large is about the same in the later months of the foetus and the earlier of the infant. But the relations of the right and left ventricles to each other become greatly altered immediately after birth. This change is very marked during the first two weeks. The effect of increased action on the function of the left ventricle, and its increase in size, becomes particularly great when the involution of the ductus arteriosus Botalli has become perfect after the first month. The relation between the right ventricle and the left becomes permanent about the time of erect walking. At that time, and later, the right ventricle has half the weight of the left. The normal proportion of the weight of the right and left heart is disturbed by such morbid conditions only, which terminate in unilateral or bilateral hypertrophy. The large majority of foetal diseases of the heart are met with in the right auricle and ventricle. Acute endocarditis and acquired valvular dis-

eases are quite frequent in children. The temptation to make the diagnosis of cardiac hypertrophy is still greater than its actual occurrence, for the heart's dulness is liable to be extensive under normal circumstances.

In twelve healthy children of from three to eight years, Gerhardts found the cardiac dulness almost as large as in adults. Dulness commenced about the third or fourth rib, its height equalled half the length of the sternum; the impulse was often found beyond the mammillary line, and not infrequently in the fourth intercostal space, for the diaphragm stands higher in children than in adults.

Abnormal shapes of the thorax are frequent causes of increased dulness. As soon as the shape of the chest becomes quadrangular or triangular in consequence of previous pleuritic adhesions or rachitic deformity, the heart touches a level surface instead of an arch, its dulness is apt to give the impression of enlargement, and its more distinct impulse that of hypertrophy.

Under normal circumstances, both the length of the arteries and their width will change in different periods of life. The common carotid has in the newly-born half the length of the descending aorta, but very much less in more advanced age, when the vertebral column increases in length. In other parts of the body the development of the arteries proceeds unequally; thus the superior thyroid bends downward to a considerable extent about the period of puberty, while the larynx is becoming larger and the thyroid gland descending. All the large arteries are getting enlarged after birth until the twentieth year; after that period the increase is slow, but does not cease altogether before the latest decade of life. Even the veins change considerably in their anatomical structure. There are a hundred valves in the veins of the lower extremities of the newly-born, which disappear readily afterwards, though there may be no anomalous retardation of the venous circulation.

The width of the arteries does not depend on their congenital predisposition only, but also on the degree of blood-pressure resulting from changes in the heart. A large or hypertrophied heart increases the size of the arteries; aortic or mitral incompetency renders them gradually smaller. On the other hand, undersize of the arteries produces a hypertrophy of the heart and lowers the circulation and blood-pressure, together with insufficient nutrition in the periphery to such an extent as to produce hæmophilia, purpura, or gastric ulcerations in the chlorotic.

Normal growth of the body and its organs depends on active blood supply and vigorous circulation. The presence of blood

with but little propelling power may give rise to swelling and congestion and nutritive disorders, such as rachitical epiphy-sitis, but not to healthy increase and function.

The labor required of both heart and lungs is greater than in the adult; thus fatigue is more easily experienced, and the necessity of sleep, the interruption or absence of which adds to exhaustion and waste, is readily explained.

In the fully developed, nothing is required but the substance, or rather constant reproduction of the bulk of the body; in the child, not only reproduction, but a new development of tissues must go on, and perpetual growth. All this has to be accomplished at the expense of a blood, which after having been drained of its surplus of solid constituents immediately after life, contains less solid constituents than the blood of the old. Thus the normal oligæmia of the child is in constant danger of increasing from normal physiological processes.

The slowness of the circulation and its insufficiency in all cases where the normal relation between heart and blood-vessels is disturbed, as, for instance, in rachitis and the watery condition of the blood, are apt to give rise to catarrh of the pharynx and larynx and respiratory organs in general. Besides, the walls of the blood-vessels are known to suffer in anæmia. They become thin, and undergo fatty degeneration, which Ponfick has found in the heart, and in the intima of the larger blood-vessels and in the capillaries. In consequence of the thinness of the blood and the changed condition of the blood-vessels, serous transudation and, now and then, extravasations will take place.

In cases of anæmia in infants, murmurs in the carotids and over the large fontanelles are by no means rare. These murmurs, audible over the brain, do not belong to rachitis only, but are found in every condition in which the blood-pressure in the large arteries of the cranial cavity is lessened.

The heart itself exhibits functional murmurs but seldom. Whenever there are murmurs present, it is safer to attribute them to organic disease rather than to merely functional disorder. Not a few of the babies and children who cry the greater part of the night have no other ailment besides general anæmia, and such children are relieved by a meal or some stimulant before they are put to bed, or given during the interruption of their sleep. The pulse of such children is sometimes very much accelerated; sometimes, however, it is slow, and sometimes irregular.

There are blood-vessels so thin and incompletely developed, and integuments so poorly formed, that bleeding will now and then make its appearance spontaneously.

Endocarditis and atheromatous degeneration are not unheard of in the young. Moutard Martin and Sanné have reported cases of atheroma in the young. The writer has in his possession the descending aorta of a girl who died at the age of seven years, with an aneurism. Ruptures of blood-vessels are very frequent, the more so the younger the individual. Vascular debility may be of two kinds. It may be local, and then give rise to miliary or larger aneurism; or it may be general, and exist while all the membranes constituting the wall are present.

III.—SURGERY.

Clutton: *Lithotrity in Children.* (*Lancet*, June 16, 1888. Reported by Dr. Cameron Kidd.)

During the last two or three years the attention of the profession has been frequently drawn to the fact that lithotrity in young children is not only a rapid but comparatively easy method of removing stones of small size from the bladder. It has been done in a boy only three years of age. The operation took only a quarter of an hour. There was no bleeding or pain afterwards, and the boy was quite well in a few days. Such a result could be obtained in no other way. The objections raised to the employment of lithotrity are found in practice to have no practical weight.

A boy, aged three, presented no symptoms, except that he cried after passing urine. This occurred several times during three days before he was brought to the hospital. A sound was introduced under chloroform, and a very small stone detected. After a two weeks' rest the operation was done. Chloroform was given, and a No. 5 lithotrite used to seize the stone, which measured three-eighths of an inch in the axis in which it had been caught. The calculus was crushed, and its fragments caught and crushed. A No. 9 canula was easily introduced, and the fragments removed by the evacuator. This case seems to be an argument in favor of lithotrity in young children.

Although the mortality is low in lithotomy, it still has a mortality, and cannot be said to be so quickly followed by convalescence as lithotrity. Other cases are reported in the *Lancet* of June 16, 1888. They show that the operation is perfectly feasible upon children who would most certainly a few years back have been cut for stone.

Although the prognosis of the lateral operation of lithotomy has been regarded favorable in children, it has only been held in good repute by comparison with the results of the operation

on adults. Every case which shows that lithotripsy may be performed with safety at an earlier age than we formerly thought possesses some clinical value.

Pasteur, W.: Abscess Outside the Tonsil. (*Lancet*, July 14, 1888.)

A child, aged three months, had always been fairly healthy and well cared for. Without discoverable cause a swelling appeared at the side of the neck. There was difficulty in swallowing and breathing; the latter was labored and catching, not unlike that of a bad case of catarrhal laryngismus. Swallowing soon became practically impossible. Looking into the mouth, the passage of the fauces was seen to be almost entirely occluded by a large swelling in the position of the right tonsil. By passing the little finger carefully behind this it was ascertained that the pharynx was perfectly free, and that a distinct fluctuation wave was also communicable from the tonsil to the tumor in the neck. An incision was made in the most dependent portion of the tumor in the neck and about three ounces of pus evacuated. All the distressing symptoms were at once relieved.

The child remained well five months, when another abscess developed in the same situation. It gave rise to similar symptoms. The same operation again gave instant relief.

On this occasion the abscess cavity was explored with the finger and its relation to the tonsil clearly established.

Owen, Edmund: Diffuse Ostitis of Tibia. (*Lancet*, June 9, 1888.)

A boy, twelve years old, had general enlargement of the left tibia. It was also bowed forward, and was increased in length at least a quarter of an inch. There was redness and oedema, and the bone was tender. There was no history of injury.

The boy had not the characteristic appearance of inherited syphilis, and there was no history of syphilitic parents. For a time the boy was kept in bed to see if he would improve without antisymphilitic treatment; but he made no progress until small doses of gray powder were regularly administered.

Remarks by Mr. Edmund Owen.—Diffuse interstitial ostitis in children is generally the result of hereditary syphilis, but in this case there was no direct evidence of congenital disease, although there were certain doubtful signs which, when taken together, afforded strong circumstantial evidence of the specific nature of the disease. This was further confirmed by the improvement under the administration of the small doses of gray powder.

Harrison, Reginald: Foreign Body in the Right Bronchus; Tracheotomy; Recovery. (*British Medical Journal*, June 23, 1888.)

A child, while eating, thought she had swallowed a damson stone. This was followed by paroxysms of coughing. The physical signs were slight flattening of the right side of the chest posteriorly, diminished expansion, feeble breathing towards the base. An inspiratory and expiratory rhonchus, and sometimes there was a sound as if something fell between expiration and inspiration.

Tracheotomy was done as low down as possible,—three or four rings being divided. Just as the child was being inverted the stone was shot out into the wound, where it was easily seized by the fingers. The patient breathed freely through the opening, and expectorated for the first four or five days a considerable quantity of pneumonic-looking sputum. Then convalescence rapidly took place.

McCarthy: A Case of Congenital "Coccygeal" Cyst in an Infant. (*Lancet*, May 12, 1888.)

There was great difficulty in diagnosing the presentation during labor, for the presenting part was a large cystic growth springing from the region of the coccyx and almost completely covering the perineum.

The child when delivered was well nourished and of fair size, but at the lower part of the back was a cystic tumor about the size of a foetal head at full time; it was covered with normal integument.

About one month after birth the cyst was tapped, and twelve ounces of straw-colored, albuminous fluid were drawn off, the last portion being slightly tinged with blood. The cyst slowly refilled, and about three weeks later was again tapped, and five ounces of similar fluid were drawn off. Some carbolic acid was injected, and this was again repeated without effect. The child, although it took food fairly well, gradually wasted from birth, and died when about eight weeks old.

At the autopsy it was found that the integument could be easily dissected from the subjacent cyst, in the thin wall of which were some very tense, small, secondary cysts. When the abdomen was opened the intestines were found to be pressed forward by a large unilocular, retroperitoneal cyst, which extended from the upper part of the perineal growth to the diaphragm. The rectum was pushed to the left, and the uterus and ovaries were carried above the fundus of the bladder. The wasting of the child was thus readily explicable. As long as the placental circulation was carried on the

foetus was well nourished ; but when, after birth, the child had to depend on absorption from its alimentary canal, gradual starvation resulted from the absorbent vessels being obstructed by the increasing pressure of the retroperitoneal cyst. It would not have been possible to diagnose with certainty the nature of the cyst during life.

Evans: Removal of a Spina Bifida with the Knife; Recovery. (*N. Y. Med. Jour.*, August 25, 1888.)

The patient, six years old, had a spina bifida of the size of an orange, involving the second and third lumbar vertebræ. He also presented the club-feet so often seen in connection with this deformity. Physical development and general condition otherwise were all that could be desired. The family history showed that two of the mother's sisters had given birth to children with spina bifida. The tumor was attached by a broad base and was quite painful on pressure, especially on the left side. At the base, on the right side, there was a small opening, through which pus was constantly discharged. Exploration with the probe and subsequently with the finger showed that the sac was lined throughout with small scales of bone, and contained necrosed tissue. The operation for removal of the tumor was begun by making an incision on the right side of the tumor well down its base. A similar incision was then commenced on the left side, but the knife had only passed through the skin when a smart flow of spinal fluid occurred. After the removal of the tumor, it was found on examination to contain two sacs, that on the left side containing the meninges of the cord and having an opening of the size of the end of a lead-pencil leading down to and through the cleft in the spine, which was large enough to admit the end of the thumb and exposed the cord to view; while that on the right was occupied by small fragments of bone, pus, and necrosed tissue. Four deep sutures were passed and made to include the spinal membranes on either side. A large pad of cotton was placed over the wound and held in position by means of a wide flannel binder. Considerable shock followed the operation. On the third day he was seized with convulsions, which lasted but a short time. There was a discharge of spinal fluid for about three weeks, after which period it gradually grew less in quantity as the wound closed. Three months have elapsed since the operation: the patient's back is entirely free from pain and tenderness on pressure; and the doctor considers him well so far as his spina bifida is concerned. Antiseptics were not used. The doctor claims the credit of being the first to record a case of extirpation of spina

bifida with the knife in which the patient survived the immediate and remote effects of the operation.

Kilner: Foreign Body in the Right Bronchus, expelled after Nine and a Half Months. (*Lancet*, June 23, 1888.)

The patient, a child aged ten, when first seen was complaining of malaise and a slight dry cough. Her temperature was 105° . Physical examination revealed a patch of dulness and tubular breathing just below the spine of the scapula on the right side. There was bronchophony but no crepitation. It was learned that ten days previously she put a clove into her mouth, and possibly inhaled it in a fit of laughing. This was followed by a severe fit of coughing and a dart of pain in her right side.

Three possible diagnoses were considered: (1) croupous pneumonia; (2) acute phthisis; and (3) a foreign body in the bronchus.

One month later the patient had an attack of inflammation of the whole of the right lung. There was high temperature and a rapid pulse. She had a cough with expectoration, which became rust-colored. During this attack she coughed up a portion of the side of the calyx of the clove. It was recognized for a certainty under the microscope.

The child became so weak that she could scarcely raise herself in bed.

She had delirium; picking at the bedclothes, but could always be aroused to consciousness. She had frequent rigors. The expectoration was purulent or muco-purulent.

The patient went on thus with only slight variation. There were at times favorable changes in the physical signs, and then the temperature would become lower, the expectoration less, and she would gain in strength.

In the fourth month of this attack she was sent to the seaside, where she gained in strength and flesh, but her daily range of temperature continued from 102° to 103° .

One month later her lung was benefited anteriorly: the dulness had disappeared; the breathing was healthy though feeble.

Posteriorly, respiration was the same above the spine of the scapula. Below the spine of the scapula there were dulness and tubular respiration, except over the cavity, where there was a dry, blowing sound. There were no râles. She had occasionally a dry cough. Her strength was fair.

In the eighth month she had a violent hæmoptysis. This was followed by cough and expectoration. Moist and gurgling

râles were now heard in the neighborhood of the cavity. There was a temperature of 103° and a pulse of 120. She gradually improved, and at the end of a month she was left more emaciated and the cavity was slightly enlarged.

During the next month she had several small hemorrhages, —each followed by a rise of temperature and cough with expectoration.

During the tenth month she had an attack of coughing; not very severe, but in the expectoration was found the offending clove almost entire.

Following this, the changes in the lungs were simply marvellous. There was yet slight dulness, but vesicular murmur was heard all over the back.

This case is interesting, not merely for its duration (two hundred and ninety-six days), but also the difficulty in diagnosis at the commencement. It would have remained doubtful to the very end except for the assistance of the microscope.

It is curious why the inflammation should have been so limited at first, and then to have spread so rapidly. Was it that the essential oil acted as a superficial caustic, preventing any further action?

Other points worthy of notice are the long period of quiescence during which the child gained strength, and the little inconvenience she felt. This fortunate circumstance probably enabled her to withstand the later relapses. It appears extraordinary for the clove to have remained in so perfect a state so long.

Donaldson: A Case of Hip-Joint Disease with Peripheral Neuritis and Epilepsy. (*British Medical Journal*, May 12, 1888.)

A boy, aged fifteen, had suffered from disease of the right hip-joint for three years. Upon examination the lower limbs were stretched out at full length in the bed. On the right thigh there were six openings, which occasionally discharged pus. Both feet were "dropped," so that the upper part of each foot was nearly on a straight line with the front of the leg. He could dorsiflex the toes and feet to a small extent. The skin from the knee down was dry, scaly, and cracked; its condition somewhat resembled ichthyosis. The knee-joints were ankylosed. The legs were very hyperæsthetic; there was no anæsthesia. The knee-jerk and plantar reflexes were present on both sides. The patient developed fits three months before death. In these he lost consciousness, and was convulsed. He never bit his tongue, and there was no aura. The patient died from exhaustion.

Remarks.—The “dropped” feet, the trophic changes in the skin and joints, and the hyperæsthesia were due to peripheral neuritis. Dr. Gowers says that nerves near suppurating joints may become inflamed. The nerves on the left side were involved, but this is supposed to have been an instance of “sympathetic neuritis.” It is well known that peripheral irritation sometimes produces epilepsy.

Bibliography.

HYGIENE OF THE NURSERY. By LOUIS STARR, M.D., Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania; Physician to the Children’s Hospital, Philadelphia, etc. Philadelphia: P. Blakiston, Son & Co.

This is a book of ten chapters, one hundred and eighty-eight pages of text, with a full and well-arranged index, with twenty-one illustrations, and is dedicated to “my little patients, some of whom, in the rapid passing of time, may soon assume parental duties.”

It is by far the best book devoted to the home management of the health of young children that we have seen, and embraces in its ten chapters such a variety of subjects as “The Features of Health,” “The Nursery,” “The Nurse-Maid,” “Clothing,” “Exercise and Amusements,” “Sleep,” “Bathing,” “Food,” “Dietary,” and “Emergencies.” The language is, in the main, free from technical terms, and the illustrations, though of the simplest articles, such as a “soap-stick” or suppository, a “bottle-tip,” a “stick for cleaning teeth,” etc., are adapted to the text, with, perhaps, the exception of Fig. 4. This picture would have been improved by a comparison of the primary with the permanent set of teeth. Though the book has but few, if any, statements which may be considered untrustworthy, there are a number which, in our opinion, might to advantage be omitted, amplified, or changed, as the case may be. To be strictly just in a review one should carefully read a book *through*. This we have done with pleasure in this instance, and can best illustrate good and what seem to us as inferior statements in order as we found them. Chapter i., entitled “The Features of Health,” devotes much space to “*variations in disease*.”

P. 18. “Twitching of the eyelids,” etc., “herald the visit of convulsions.” Too strong a statement, when so frequently convulsions do *not* follow such twitching. So we call to mind cases

where "large globular" heads were *not* "characteristic of hydrocephalus" (p. 20),—heads that followed the shape of the head of one of the parents, usually the father's.

P. 38. More comment should be given as to the disparity of the pulse-rate at different ages. It is astonishing how ignorant the people are, and how little tabulated statements help the majority.

P. 43. We had supposed that the time had gone by when the finger was advised to be used as a tongue spatula by an attendant. A *smooth*-handled spoon, or a proper tongue depressor, made for the purpose, is better. We are sorry that Dr. Starr has not pointed out how even young children can be taught to depress their own tongues with their own fingers.

P. 44. Directions how to hold the child for an examination of throat not specific enough. Too much left to the judgment of the untrained attendant.

P. 45 does not state in what classes of infants dentition is likely to be attended by pain, etc. This is important, as there is so much error afloat in regard to the "dangers of dentition."

Chap. ii. p. 49. The positive statement that there should be *two* nurseries in every well-regulated house where there are children can hardly be endorsed. Two nurseries may be desirable, but are not necessary, and the belief in their necessity might prevent marriage among some couples of moderate means.

Pp. 51–56 give excellent directions as to the amount of air-space needed, arrangement of medicine-closet, height of walls, arrangement of floor, etc., in a nursery.

P. 58. While the means for window ventilation mentioned are good, the reader is not impressed with the importance of keeping ventilators free and clear. We have known of rags, shawls, hoods, and baby clothes being pressed into them to "keep out the cold."

P. 61. Under this head of "Cleaning," or elsewhere, we have not noticed directions for the prompt removal from the nursery, or for the disinfection, of soiled napkins or bedclothing.

Chap. iii., on "The Nurse-Maid," is a good one. The non-employment of women with "old leg ulcers" or badly-smelling feet may well be insisted upon. Children's sensibilities are more acute than people have believed them to be.

Chap. iv. p. 69. In connection with directions as to use of napkins no mention is made of the irritating effects of some of the laundry soaps.

Pp. 70–81, dealing with shoes and proper make of clothing, materials, etc., are valuable.

Chap. v. In this excellent chapter on "Exercise and Amusements," the dangers of roller-skating and bicycling are pointed

out, and allusion (not extended enough) is made to the easy contamination of the morals of children playing together without sufficient supervision,—an evil which seems to be increasing in our large cities, even among the best (?) families.

So, too, on p. 89, too little stress is given to the forcing of the brains, especially of the active, bright, sensitive children, at home and in school, frequently to the neglect of the less forward children,—a matter of moment in both the family and the school.

Chap. vi., on "Sleep," needs no comment other than very good.

Chap. vii., "Bathing." P. 98. There seems a sort of incongruity between the statement here that *cold* baths are not to be recommended, and that on p. 109, where the reader is told how to use a cold bath in cases of high fever. Such baths should be given under the direction of the physician, and are not to be used by the anxious, not cool-headed attendant.

P. 99. To use flannel instead of the ordinary wash-rag is good advice, and not usually given.

P. 106. Not specific enough as to sea-water bathing for young children. "Carrying the child into the waves, and the immersion of his head, as is often done," is cruel, etc.; but *properly done* it is not cruel. To habitually have the children play in the pools along the shore is to frequently bring them in contact with warm water, and at times fouled water, especially at the popular sea-side resorts.

Chap. viii., "Food." Pp. 114–126. While referring to the importance of nursing by the mother, the author does not dwell, as we think he might have done, upon the fact, that the number of women who cannot nurse is increasing, and also the number who will not, owing to improper advice.

On p. 127 he seems to indirectly encourage artificial feeding by his statement that so many nursed children are puny, etc. He also omits to dwell upon the various means of increasing the milk, by out-door exercise, etc., and fails to encourage sufficiently the woman who could nurse if she would.

P. 122. The overuse of powerful suction breast-pumps has not been alluded to.

And p. 126. The risks of procuring proper wet-nurses, the trickery resorted to by some to obtain positions, how to procure, etc., have not been fully referred to.

P. 130, note. The use of litmus-paper as a test for acidity is not valuable, as Dr. Squibb says, unless little pieces of the paper are examined *under* and *in* the milk. Exposure to air sometimes reddens the dipped paper when the milk is not acid.

Pp. 132–158. Very wisely does the author show the value of cow's milk, properly prepared as a food, compared with the

average "infant food" in the market ; but we cannot agree with him that the amount of sugar in condensed milk counteracts the tendency to constipation. In our experience it has increased it. His suggestions as to the use of a graduated bottle or glass graduate to insure accuracy as to the proper admixture of food ingredients, should be emphasized by physicians. "Spoonfuls of this or that" often leads to mistakes. The sham of one cow's milk, as milk is usually obtained by families, should be pointed out, and those having care of young children might well be advised to occasionally visit the so-called dairies of the city milkmen.

Chap. ix., on "Dietary," is one of the best. The different recipes are plainly detailed, but we notice that the glass graduate might quite frequently be used with advantage in dealing with liquids. We are sorry that cocoa is not mentioned, as it is one of the most valuable of foods for children. So, also, the fact is not mentioned that junket made from milk fresh from the cow, and rich in cream, is more palatable, and probably, therefore, more valuable, than when made from ordinary city milk. The laxative character of beef-tea with some children is not spoken of. Much labor would be avoided by the attendant in the preparation of beef extracts, etc., by the use of a meat-press.

Chap. x., on "Emergencies," is of more real service than much that is written by medical men and women on this subject. Finally, an author is found who does not recommend carroll oil for burns. Useful as it has been in its day, carbolic acid and olive oil, baking soda, etc., are as serviceable and more cleanly. The advice to wrap cotton on a little stick to remove foreign particles from the eye does not seem a safe one in a book for nurses and parents. A soft camel's-hair brush dipped, it may be, in good castor oil is a safer instrument. We regret that the author has not spoken of the value of a good magnifying-glass in the nursery for the detection of stings, slivers, beginning of eruptions, etc. Finally, on p. 198, in referring to the appearance of various eruptions, neither measles, scarlet fever, chicken-pox, or smallpox is said to appear first in the throat, where, in our experience at least, they generally have appeared.

We close, as we began, our review of Dr. Starr's book, by the statement that it is by far the best book we have read upon this subject, and this is done after realizing how impossible it is to write a perfect book, and how hard it is for one dealing in technical terms in his daily business to write a popular book on semi-technical subjects which shall be free from technicalities.

J. W.

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THERAPEUTICS OF INFANCY AND CHILD-
HOOD.

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(Continued from January Number.)

V.—INFECTIOUS DISEASES.

6. *Measles.*

THE virus of measles appears to be more volatile than that of any of the other contagious diseases. The communicability appears to be greatest during the prodromal stage, and the invasion takes place, in all probability, through the bronchial mucous membrane. The incubation may last thirteen days, the first four or five of which may be attended with some fever. During all this time, and during its whole course, the disease is contagious.

Very few cases are seen during the first six months of life. After that it is common, and repeated invasions are frequent. In many seasons the mortality is very trifling; in some epidemics it has reached thirty-three per cent. of all the cases. The first epidemic occurring in regions where measles had not been known previously was found to be very dangerous, and those which occur after long interruptions are likely to prove

very severe. Thus the question whether the well should be separated from the sick will depend a great deal on the severity of the epidemic.

The temperature of the room should be comfortable, a little warmer than in scarlatina, and the air moist. The light ought to be excluded to a certain extent, but not to absolute darkness. For a number of days the child should be kept in bed, unless very restless, in which case it may be taken out well covered. It is a good rule to keep the patient in bed a week after the disappearance of the fever, and in the house ten days or a fortnight longer. Relapses are not uncommon, and those particularly who have hereditary tendency to tuberculosis ought to be protected from exposure. Especial care must be taken during the cool or rainy season.

Mild cases require mostly a hygienic treatment only; still, every case has its own indications. Where there is otitis, bronchitis, pneumonia, or dysentery, it is self-understood that the patient must be kept in bed during the continuance of the complication. Warm and dry weather and a sandy soil will permit a patient to leave the house sooner than under other circumstances.

Constipation may demand gentle treatment in the beginning. As a rule, an enema will suffice. Castor oil or the elixir of rhamnus purshiana may sometimes be required. No drastic should be used because of the tendency to diarrhœa or dysentery prevailing in many instances. For the same reason no glycerin should be injected into the rectum.

A convulsion in the beginning of the disease does not always mean great harm. It takes the place of the chill in the adult, but is more dangerous because of the possibility of hemorrhages occurring while it lasts. Thus it ought to be cut short as soon as possible. Chloroform inhalations will relieve the spasm, chloral hydrate internally, or in an enema, the persistent irritability. Warm bathing may be resorted to when under these circumstances the eruption is slow in showing itself. The head has to be kept cool, the feet warm.

Epistaxis may be left alone while mild. It is sometimes a relief to the congested mucous membrane of the nares. When severe it has to be stopped.

The organs of circulation do not suffer often in measles. Endocarditis is met with but very rarely, but in epidemics of unusual severity heart-failure is of frequent occurrence. It is to be treated according to the principles laid down in the articles on scarlatina and typhoid fever. A peculiar feature in very severe measles is the frequency of thromboses. Indeed, in no other infectious disease are they met with as often as in measles. The thrombi occur in the vulva, in the skin and subcutaneous tissue, about the face as cancrum oris (noma), on the distal parts of the extremities, particularly the legs. Purpura is not frequent, but gangrene of the skin is not at all uncommon in such cases. The odor in them, and in cancrum oris, is very offensive indeed, and requires strong disinfectants and deodorizers. Thymol in solution of one to one thousand, iodoform in powder or in vaseline ointment, will be found serviceable.

What has been called hemorrhagic measles is not always very malignant. In a great many cases it means nothing but the effusion of some hæmatin into the eruption.

As is well known, the respiratory organs suffer mostly in measles. There is always catarrh of the nose, which may lead at an early period to tumefaction of the lymph bodies around the neck. If such be the case the catarrh must not be left alone, but treated with gentle injections of a solution of salt water or boracic acid. The conjunctivitis connected with it requires tepid or cool application, or instillation several times a day of a few drops of a two-per-cent. cocaine solution. A moderate amount of bronchial catarrh may be left alone provided the cough is not very severe, for severe attacks of coughing, even without much congestion or inflammation, may produce bronchiectasis or emphysema. Particularly is such the case when there is complication with pertussis. Here morphine may be given in sufficient doses. Bronchitis is rarely dangerous unless it be capillary. Broncho-pneumonia is always a serious complication and a very frequent one. In a number of cases its course is very rapid, accompanied with cyanosis and a very small pulse. Active treatment is required in these cases. The inhalation of oxygen will now and then bridge over urgent conditions. Warm bathing

and cold affusion in a warm bath will be of good service, for it is necessary that the patients, particularly small children, should cry. Unless they cry they will suffocate. Stimulant expectorants are in order, such as camphor, benzoic acid, or carbonate of ammonia. The muriate of ammonia is not sufficient. Cardiac stimulants are required at the same time, such as digitalis, spartein, musk. No depressant expectorants should be given. Antimonials should be avoided at any rate.

There is always some catarrh of the larynx. When the croupous symptoms are very urgent the air of the room ought to be filled with steam, and the patient encouraged to drink as much as possible, particularly of alkaline waters. The internal administration of the iodide of potassium in moderate doses will do good service. So will an opiate, particularly at bedtime. In connection with the catarrhal affection of the nose, otitis is now and then seen. According to Schwartze, three per cent. of all the cases of otitis can be traced back to measles.

During all this time the kidneys ought to be watched. It is true that nephritis is by no means a frequent occurrence in measles, but it has been found often enough to justify the greatest attention.

Cerebral complications have no special indications. Rules for their treatment will form the subject of a future chapter.

7. *Rötheln (Rubella).*

It has not yet conquered an indisputable place in pathology. There are still many who do not take it to be a separate disease. The eruption looks mostly like measles, sometimes like erythema, or urticaria, or scarlatina. Many cases have been described which were connected with catarrh of the respiratory organs and of the throat, with glandular swellings and fever. These are the cases which have been described under the name of rubella morbillosa, and would be diagnosticated by many, myself included, not as rötheln, or rubella, but as a mild form of measles. If there be any such special disease, no special treatment is required.

8. *Mumps.*

The incubation lasts a fortnight, and sometimes three weeks. Thus prevention by isolation can seldom be accomplished.

The infection must be presumed to take place through the Stenonian duct. Thus a careful hygiene of the mouth must be considered the best preventive. Often the patients do not feel very sick. Many do not take to their beds. In many cases covering the swelling with cotton is sufficient to protect it. Where there is a great deal of pain narcotic applications may be made, or ice applied. The latter certainly reduces the amount of swelling, although it may not shorten the course of the disease. I have often found the application of iodoform colodion (one to eight or ten), made twice a day over the whole surface, quite successful. When there is a tendency to suppuration, warm applications will favor it. Then incisions must be made in time, be large, and treated antiseptically. The diet must be that of all fevers,—fluid. A consecutive anæmia which is more frequent than the apparent mildness of the affection would seem to explain, requires generous feeding, iron, nux, and a change of climate.

9. *Variola.*

Vaccination ought to take place early, for variola in the first year is quite frequent among those not vaccinated. There are also many cases of variola among those not vaccinated between the eleventh and twelfth years. The smallpox reports of the German empire emphasize the fact that no case of variola occurring in vaccinated children who had more than two cicatrices, terminated fatally; nor was there a fatal case among those who were revaccinated. There was no fatal case where the vaccination marks were very distinct, between the thirteenth and forty-fourth years. The fact that none died that exhibited more than two marks appears to prove that the single mark customary among us may not be sufficient. At all events, many of our children vaccinated in the first year of life will undergo a successful revaccination when they are only from four to six years old. At that time revaccination ought to be tried.

Isolation is now recognized as an absolute necessity in the case of variola more than in any other disease. Thus little difficulty is encountered by ill will or ignorance. Patients with variola ought to be kept cool, washed frequently with

cold or tepid water; now and then an ether spray over sore parts will be found quite agreeable. Fever is sometimes very high, and ought then to be modified by antipyretics. The delirium is sometimes so violent, and bordering on mania, that the inhalation of chloroform or the administration of chloral hydrate is required. The eyes ought to be covered with cold compresses, sore places covered with vaseline or lead ointment. Superficial sores particularly, and those which yield an offensive odor, should be treated with thymol, salicylic acid, or iodoform. Scabs must be removed from the nostrils so as to facilitate respiration; abscesses should be opened in time and disinfected, and complications treated. One of the most severe complications is œdema of the larynx, or laryngitis, which may require, on short notice, tracheotomy or intubation.

After the disappearance of the fever stage the patient ought to be bathed once every day or every other day, and inunctions of fat made all over the surface until desquamation is complete.

10. *Varicella (Chicken-pox).*

Bad cases must be kept in bed. Very few require medicinal treatment. A small number of instances of consecutive nephritis are now on record; thus the urine ought to be examined in every case.

11. *Erysipelas.*

It is so communicable that even a physician may carry it. Still, it is not probable that the healthy surface can be attacked by it. As in most cases of diphtheria, so in all cases of erysipelas, a sore surface forms the resting-place of the disease. Erysipelas may make its appearance on an eczematous skin. On the head it sometimes escapes notice for some days. Excoriations of the anus and sexual organs, or slight injuries done by a pin or by the finger-nail, are sufficient to give rise to it. It often originates in the intertrigo of the infant, or in the neighborhood of a vaccination mark. In the latter case it seldom appears immediately after vaccination, very often not before the second week or later. Chronic nasal catarrh is a frequent cause. Some children will have erysipelas extending over both cheeks once or more every year. Slight or large

operation wounds are a frequent cause; so is diphtheria, and many cases are seen to take their start from a tracheotomy wound. In the newly-born it appears, as a rule, on or near the navel, and is generally connected with universal sepsis. Prevention of the disease will mainly depend on the removal, or relief, of the several causes which have been enumerated.

Every case of erysipelas must be isolated; the diet and general treatment be regulated on general principles. The local treatment may be quite simple in some cases. The erysipelatous surface may simply be covered with soft cotton, or a powder of talcum, or of amylum, or one part of salicylic acid with perhaps ten parts of oxide of zinc and twenty-five of amylum. Applications of lead wash and opium, or of sulphate of zinc, have been in general use for a long time; also of solutions of sulphate of iron; now and then the application or inunction of blue ointment. The latter I cannot advise because of the pain and irritation resulting. The inflamed surface has been covered with collodion. Infants and children will not bear it. Ferreire has used, in a case of erysipelas on the leg of a child of two years and a half, a mixture of one part of resorcin in seven thousand five hundred of traumaticin (0.008:60.0). Cold applications have been made, ice has been applied, and where the extent of the erysipelas is but limited, to great advantage. Incisions outside the inflamed portion have been advised. They are useless and brutal, because the lymphatics are, as a rule, infected a good while before the inflammation shows on the surface. That is the reason why neither saturated solution of nitrate of silver nor the solid caustic have been of advantage.

Hueter recommended many years ago the subcutaneous injection of a two-per-cent. solution of carbolic acid round the inflamed surface, and claimed to have confined every case within its original limits. In place of that, I advised many years ago the application, not on, but around, the erysipelatous area, of a mixture of one part of carbolic acid in eight, ten, or fifteen parts of oleic acid. I have treated many cases in that way, and most of them quite successfully. The application was to be rubbed into the surface around the diseased part at frequent intervals, or, when the erysipelas was confined to the

extremity, a band or compress soaked in the mixture was applied above or below the diseased part, not infrequently with the result of stopping the process. Instead of the carbolic acid as administered by Hueter, Ducrey uses a solution of one part of corrosive sublimate in one thousand of water, and repeats the injections, which are to be made three centimetres apart, after twelve hours. A better plan, however, is, after all, to apply carbolic acid, one part dissolved in ten or fifteen of alcohol, directly to and beyond the surface, every hour or every few hours. It is readily absorbed, and may do good. It will do good in most cases, but may do harm by affecting the kidneys. Thus in every case where it is to be applied the kidneys must be watched carefully, and particularly in young children. Carbolic acid being rapidly absorbed, will affect infants very severely.

The internal administration of the tincture of chloride of iron has been considered a specific by many. That opinion is certainly based on an exaggeration of its merits. The preparation is, however, an antifermentative, and while being a vascular stimulant, does not give rise to fever in infectious diseases as it would do in simple inflammatory fevers.

Abscesses complicating erysipelas require large incisions and antiseptic treatment. Erysipelas of the neck is very often complicated with œdema of the larynx, and may require scarification, tracheotomy, or intubation.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from January Number.)

III.—STOMATITIS MYCOSA.

Symptomatology.—It has been admitted that a child, perfectly healthy in all respects, can be infected with thrush, and the attempt has been made to show that the first lodgement of the parasite is due more to mechanical causes than to any other

circumstance. Yet the former proposition must be accepted as the exception and not the rule, and the latter as signifying that children whose mouths are otherwise affected are, as a rule, more liable to these mechanical conditions than healthy ones. It will follow, therefore, that the symptoms of stomatitis mycosa are of a complex nature; those due to the stomatitis and those due to remote conditions, either predisposing, coexisting, or following the lesion of the mouth.

It will be seen that the term stomatitis mycosa has been used to designate the affection under discussion. This has been done because, in every instance, there are present the evidences of a stomatitis which is due to the irritation produced by the fungus; therefore a stomatitis mycosa. The subjective symptoms produced by the fungus, in a purely local case of thrush, vary with the intensity of the affection. In some cases, when the affection is but slightly developed, the patient suffers very little, if at all. It can be put down as a rule that pain is present only when the corium is attacked. The mechanical disturbances produced may be varied and various, depending entirely upon the part of the mouth affected. In the beginning we usually see the tip of the tongue the seat of the trouble. With this the lips are affected, and from these two places the parasite may grow in all directions. Most commonly, the tongue suffers most; from it infection may take place upon the tonsils, and then we have the symptoms of an amygdalitis, difficulty in swallowing, painful swallowing, and, finally, absolute refusal of food. When the tongue and the lips alone are affected, providing always the fungus has grown into the corium, we get the symptoms described under catarrhal stomatitis. In those cases in which the *saccharomyces* has grown upon the œsophagus the symptoms may become still more intense. Cases are on record in which the whole of the œsophagus has been filled up with a cylindrical cast made up entirely of the spores and mycelium of the parasite. There is no doubt that the observations of the French authors (Valleix, Seux) are correct as to the frequency of thrush in the œsophagus. These observers found it in thirty-two cases out of forty-two which were examined post-mortem. Although this ratio overestimates the comparative frequency of thrush

of the œsophagus, yet we have no positive proof that it does not exist during life. It is certain that autopsies, carefully conducted, will show the presence of thrush in the œsophagus in a far greater number of cases than we have reason to suppose when judging from the symptoms alone. When a plug is filling out the œsophagus, swallowing becomes impossible; but, fortunately, the attempt is sometimes followed by vomiting, by means of which the plug may be expelled. The question whether the saccharomyces produces gastro-intestinal troubles has been answered in various ways. The French authors claim that it does, and, in addition, that intestinal troubles are almost a *conditio sine quâ non* of stomatitis mycosa. On the other hand, Bohn and most of the German authors claim that the disturbances of the intestinal tract frequently precede the stomatitis, and can, therefore, not be looked upon as sequelæ. It has already been pointed out that intestinal troubles need not accompany, precede, or follow thrush, and it has been stated that hospital patients are not the class of subjects upon which observations of this nature should be made. Especially is this the case when the hospitals in which these studies were made are themselves taken into consideration. If the experience of private practice be considered, it will be seen that bowel troubles with stomatitis mycosa are the exception and not the rule. This is especially applicable to that better class of patients that watches its children intelligently. For when thrush is treated properly in its beginning, intestinal or gastric troubles are simply out of the question. On the other hand, disturbances of the gastro-intestinal tract are the rule when stomatitis mycosa is under full headway. It is probable that the saccharomyces is alone sufficient to account for attacks of dyspepsia when swallowed in great quantity; but it is certain that the taking into the stomach of great quantities of saliva, holding in solution the chemical results of the biological activity of the fungus, frequently causes catarrhal troubles of the gastro-intestinal mucous membrane. When the fungus develops in the mucous membrane it produces the symptoms of well-marked disturbance. Statistics are wanting concerning the frequency of all these occurrences. But it will be seen that thrush as a slight

localized affection and under proper conditions need not affect the patient very seriously, while an extension to the tonsils, the œsophagus, the stomach, or even an extensive localized invasion of the mouth, must always be looked upon as a serious matter because of the digestive troubles which may follow. Again, thrush, when developing in a debilitated patient, the debility due to any cause immaterial, whether from gastro-intestinal disturbances, typhoid fever, pneumonia, phthisis, or what not, becomes a very much more serious disease than in a healthy child. Thrush occurs in debilitated subjects, as has been pointed out, and the most common cause for debility in infants is disease of the mucous membrane of the gastro-intestinal tract; it was therefore quite natural that the two conditions should have been looked upon as bearing the relation of cause and effect to each other. The fact of the matter is that the former simply bears the relation of predisposing cause to the latter, the saccharomyces being the real cause.

Formerly great stress was laid upon the appearance of intertrigo with thrush, and it cannot be denied that intertrigo, or eczema ad natem, does occur very frequently in patients with stomatitis mycosa. The explanation is to be found in the fact that infants who have disturbances of the gastro-intestinal tract frequently have intertrigo; but this is due not to the saccharomyces but to the chemically-altered stool which irritates the skin over which it passes.

We find the characteristic lesions of thrush in the mouth. The beginning, as has been stated, is most commonly at the tip of the tongue, and we here see small, discrete, grayish-white spots. When these are carefully examined by reflected light, it will be observed that they are covered by epithelium and are surrounded by a narrow ring of injected blood-vessels. Upon attempting to remove them it will be found that considerable violence is required, and when it is accomplished there is left a red surface, slightly depressed, which bleeds very readily. The latter condition obtains for all the various stages of the eruption, unless the whole mucous membrane is very much swollen, when a slight depression cannot be noticed. In the next period of development the spots will have grown, not so much in diameter as in height, and it will then be seen

that they project somewhat beyond the level of the mucous membrane. This occurs in a comparatively short time, and after it more or less general infection of the mouth takes place. The latter does not follow as a necessity, but if these first two states go on unnoticed, the chances are very much in favor of more or less general infection. After this the spots enlarge, sometimes meet, and then the whole tongue may look as if covered by a membrane, the color of which depends upon the color of the food. When not colored by the food the membrane looks a dirty grayish white.

Sometimes the eruption begins upon the lips, the cheeks, or the soft palate ; as a rule, that part lying directly opposite to the place first infected becomes affected next. When thrush begins upon the tip of the tongue it is the mucous membrane of the lower lip which becomes affected ; when upon the cheek it is that part of the tongue which rests against the infected cheek, so that a direct connection between the primary and secondary invasions can be traced out. Again, under such conditions, it will be found that the two eruptions are in different states. The difference does not exist where cases are very far advanced and the various spots look alike. The mucous membrane between the spots is usually very much injected, of a dark-red color, and showing evidences of catarrhal stomatitis. At times the fungus drops off or is detached, and slight ulcerations remain which may again be filled up with the parasitic mass in a very short time, or may remain as ulcerations, rather intractable, and of a very chronic nature if left to themselves. These ulcers may be the source of infection from poisons of a different nature, and ought, therefore, to demand the attention of the physician.

The differential diagnosis has been left for consideration until the various forms of stomatitis shall have been discussed. There is one point to which especial attention must be called in this connection. The beginner is sometimes at a loss to decide whether he is dealing with small masses of coagulated milk which have remained upon the mucous membrane or with thrush. If a camel's-hair brush or the finger be applied to coagula, it will be seen that they can be removed without any difficulty ; with thrush, difficulty will be experienced and

there will be left the raw surface. When the appearances are studied with care it rarely becomes necessary to use the microscope for making the diagnosis positive. But where there is any doubt, the microscopical appearance of the saccharomyces will be found so positively clear that there can be no hesitancy in their recognition by the veriest tyro.

Prognosis depends more upon the patient in whom thrush develops than upon the thrush itself. A local process in an otherwise healthy child is perfectly harmless, especially when properly treated. Thrush in a debilitated, enfeebled infant may be the cause of death,—the straw that breaks the camel's back. Again, stomatitis in a child with bad hereditary tendencies may become a very serious affection. Furthermore, the place of development must be taken into consideration. Thrush of the œsophagus will almost always be fatal; one may not be able to diagnosticate its existence, and even when this is done its removal is next to impossible. The younger the child, the more extensive the eruption, the worse the prognosis.

Last comes the factor of treatment. Careful management will do most to lessen the mortality from stomatitis mycosa. This should be especially taken into consideration by hospital physicians. There is no possible excuse for the high mortality reported from thrush; with the light thrown upon the subject from the laws of disinfection, cases can certainly be isolated without difficulty, so that the weak in the wards can be protected. In private practice it is a matter of extreme rarity to see a patient die from stomatitis mycosa, although all cases should be carefully treated, as many complications can be prevented which, although not directly fatal, may finally influence the child's condition of health.

Treatment.—Prophylaxis is of as much importance in this affection as the treatment proper; but cleanliness is absolutely imperative in both. As to prophylaxis, it is necessary to remember that all slight abrasions of the mucous membrane may become infected with the saccharomyces albicans. Furthermore, everything must be watched which might, by any possibility, be a place for the development of the fungus in appreciable quantity. For this reason it is well to teach the mother or the nurse how to keep the nipples clean, and how to cleanse

the mouth of the infant. Wet-nurses should always be carefully inspected, their nipples and the mouths of their children inspected before permission is given to nurse the child for which they are engaged. When the child is brought up on artificial food, the whole apparatus for feeding must be kept scrupulously clean, and the attendants must be taught how to do this. Not only is this important as far as thrush is concerned, but also in a great many other directions. The best and, upon the whole, the safest disinfectant for the feeding utensils is exposure to the temperature of boiling water for a little while. But every part of the apparatus should be so arranged that the boiling water can gain access to it, and that any deposit can be removed mechanically. When this is rigidly carried out, infection becomes impossible even in hospitals.

When the diagnosis has been made the treatment proper will consist of two distinct parts: the first, the mechanical removal of the fungus; the second, its destruction. A moderate amount of violence is necessary to accomplish the first, and, in order to insure the carrying out of instructions, it is best to reduce instructions to a method. The attendants must be told to wash out the mouth at stated times,—for instance, between the times of nursing and immediately after nursing. It has been found that removal of the growth is easier when an alkali is used; for this purpose the sodium bicarbonate (one dram to a tumbler of water) is very serviceable. Whether or no it has antimycotic effects, as far as the *saccharomyces* is concerned, is debatable ground. In former days the assumption that the fungus could not exist upon an alkaline soil was taken for granted, and because the *saccharomyces* was followed by an acid reaction, therefore an alkaline remedy was the proper one. Even if the soda has no especial effect upon the parasite, it has its indications in thrush, not the least important being that it causes the epithelial covering to be removed more readily, so that we can get at the fungus; where the epithelial coating has already been removed, it causes the mycelium to be less adherent, solving mucus and the substance holding the threads together. In addition, the remedies to be used must be applied frequently—four or five times daily—and with a brush.

In using remedies for thrush, it has been my custom for years to avoid prescribing syrups; the orthodox borax and honey mixture has always seemed to me to add fuel to the fire. Any number of medicines have been recommended in the treatment of this affection: potassium chlorate, potassium permanganate, borax, boric acid, the hyposulphites, salol, etc. This fact alone shows that they are of secondary importance, for all have supporters, and all have been followed by good results. If the physician but adheres to the mechanical removal of the fungus masses, cure will follow. Up to the present the remedy or remedies which will prevent the growth of the *saccharomyces albicans* has not been experimentally determined upon. As far as my own experience is concerned, I have rarely found it necessary to use anything but sodium bicarbonate. Occasionally, when ulcers are produced, it becomes necessary to touch them with silver nitrate, but in uncomplicated cases this is exceedingly rare. There are some cases which will resist any method or all methods of treatment. But no case, when taken in the beginning, should be allowed to spread; a careful examination of the mouth will reveal the points of development of the fungus, and their removal ends the disease as far as those places are concerned.

Calomel in small doses or corrosive sublimate very much diluted almost always act as specifics in intestinal troubles which are due to thrush. But the relation between intestinal troubles and thrush must always be kept in mind, and the indiscriminate use of cathartic alkalies or other laxatives must be prevented as doing the patient more harm than good, reducing his strength and being absolutely harmful and needless. Baginsky claims good results from resorcin, and warns against the use of too large a dose (from one-half to one-per-cent. solution—never more than one teaspoonful every two hours). It is difficult to conceive how this, or any other remedy, is going to produce an effect upon an œsophagus stopped up completely by plugs of parasitic growth. When a conjectural diagnosis of œsophageal thrush has been made, it seems most expedient to introduce the soft catheter into the œsophagus. In one case I have succeeded in gradually working my way into the stomach with a catheter; some of the masses were pushed into

the stomach and were then removed by vomiting. The patient, however, died a few days afterwards and post-mortem examination showed the œsophagus again filled up.

(To be continued.)

RETRO-PHARYNGEAL ABSCESS.*

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ABSCESS in the retro-pharyngeal cellular tissue is of comparatively infrequent occurrence. From its position it is very apt to give rise to the most alarming symptoms. Partly from the fact that the greater number of these cases occur in young infants, in whom the pharynx is often difficult to inspect, and partly that, owing to their infrequency, the practitioner is off his guard, the number of reported cases in which the true state of affairs has escaped recognition, till almost too late, is numerous. If they serve no other purpose than as reminders, the following notes may not be without some interest:

CASE I.—Alice H., æt. ten months, inmate of the St. Margaret's Nursery, a poorly-nourished, anæmic infant, bottle-fed since two months old, had been under treatment for the previous six weeks, suffering from digestive disorders, and from a succession of small furunculæ appearing in various parts of the body, especially about the scalp. On March 17 she had a convulsion, for which the usual remedies were employed. At my visit the following day a careful examination was made, without detecting much at fault. The nares were blocked up with a catarrhal discharge; there was a slight cough and frequent sneezing, with a temperature of 102° F. I supposed the symptoms to indicate the onset of an attack of pertussis, of which we had already several cases in the building. The infant remained somewhat feverish and very restless for the following six days, without change in the general

* Read before the Montreal Medico-Chirurgical Society, November 16 1888.

symptoms, but evidently failing in nutrition. On the 25th I was informed that it had refused its food, being apparently unable to swallow. Its cry was faint; there was considerable retraction of the epigastrium and lower ribs on inspiration. A few large râles were heard at both bases, but insufficient to account for the retraction. There was slight enlargement of the cervical glands, especially on the right side. The temperature was 101°. On inspection of the throat I found the pharyngeal mucous membrane pressed forward, redder than usual, and quite filling the upper part of the pharynx. On examination with my finger a firm, elastic swelling was detected, whose margin I was unable to define accurately, but which did not seem to extend far down. As the symptoms were urgent, a carefully-guarded bistoury was at once passed in, and vent given to a small quantity of purulent matter by a vertical slit. For the few following days I made gentle pressure with my finger from below upward, and endeavored, as West suggests,* to press out any remaining pus. The infant was put on cod-liver oil and iron wine, and, as far as the abscess was concerned, made a good recovery.

For the notes of the following case I am indebted to Dr. George Ross:

CASE II.—A. M., æt. eight months, on 24th of December, 1887, having been apparently up till this time in perfect health, was seized with a violent convulsion. On examination, no cause for the convulsion was obtained. The infant passed a restless night, notwithstanding the administration of laxatives and bromide, and when seen next day was found crying, evidently in pain. There was slight fever, but he nursed and drank freely. For five or six days there was little alteration in the symptoms. The fever remained; the infant got little sleep, and was evidently sick, but the diagnosis remained obscure. At the end of that time he rather suddenly developed a difficulty in swallowing, and shortly afterwards refused his food altogether. While lying back he made a gurgling sound like a person gargling. The throat was inspected, but nothing abnormal was detected; only a

* "Diseases of Infancy and Childhood," 6th ed., London, 1874, p. 601.

quantity of frothy salivary fluid was seen on the fauces. A consultation with Dr. Blackader was arranged for; but, on arriving next morning, we were informed that, a few hours previously, the baby had regurgitated with violence through mouth and nares a considerable quantity of pus. On examination, pus was seen welling up freely from the pharynx into the mouth, and some of it escaping through the nostrils. There was immediate relief to all the symptoms, and the child soon appeared quite well. Ten days afterwards some enlarged glands were detected on the side of the neck. These went on to suppuration and were opened by Dr. Shepherd, with antiseptic precautions. They soon healed, and a complete recovery at once followed.

For the following notes I am indebted to Dr. Shepherd:

CASE III.—A. R., æt. nine months, female, had been noticed for a week previous to swallow with difficulty and cough considerably after doing so. There had been decided pyrexia. On examination, a large fluctuating tumor was found protruding from behind the pharynx into the throat. Fluctuation was also readily made out behind the sternomastoid on the left side, where a distinct swelling could be seen. Considering the size of the tumor, it was deemed wiser to open it externally, after Hilton's method.* A small incision was made through skin and fascia, behind the middle of the left sterno-mastoid muscle. A director was then thrust in towards the pharynx, and a quantity of creamy pus oozed out. A pair of dressing forceps was then introduced, closed, through the opening, and, when in the sac, opened, and withdrawn open. Several ounces of pus were evacuated. Drainage was secured. No caries of the vertebræ was detected. The sinus discharged a good deal of thin, watery pus for some weeks.

Formerly the view was entertained that abscess in the pharynx was nearly always symptomatic of spinal caries. This view has now been quite abandoned, as statistics show that the great majority of all the cases are idiopathic and occur in infancy. Among the more recent contributions to our knowl-

* "Rest and Pain," Am. edition, New York, 1879, pp. 76.

edge of this affection perhaps the most valuable have been those of Bokai,* who, in his two papers, has given us the statistics of two hundred and four cases, which were observed at the Children's Hospital at Pesth, between the years 1854-80, in a total attendance during that period of nearly one hundred and fifty thousand patients. Of these two hundred and four cases, one hundred and eighty-nine were of the idiopathic form, seven were secondary to caries of the vertebræ, seven were secondary to burrowing of pus from abscesses in the neck, and one was traumatic. The great majority of these cases occurred under two years; one hundred and ninety-six out of the two hundred and four occurred under three years. In ninety-seven cases collected by Gautier† nearly one-third of the patients were infants under one year, and Henoch says almost all his cases affected children who were in the first year of life or very little older.‡ Cases arising from caries, tonsillitis, traumatism, and pus burrowing from other situations in the neck, are liable to occur at all ages. In his first paper, Bokai referred the idiopathic form of these abscesses to a phlegmonous inflammation of the connective tissue, but later investigations have indicated a dependence on a lymphadenitis, and Bokai advocates this view in his last paper. Dr. J. O. Roe, in a very exhaustive paper (to which I am indebted for many of my facts) read before the Laryngological Society at its annual meeting in 1884, also urges this view, but Dr. Lefferts,§ in replying to the paper, regards the idiopathic form of abscess "as probably due to a simple phlegmonous inflammation of the cellular tissue arising from causes which produce similar abscesses elsewhere." Henoch|| thinks that the assumption that they start primarily in the lymphatic glands situated in front of the vertebræ is not by any means positively determined: and Baginsky says, "While we can with Bokai distinguish idiopathic abscess from that secondary to suppuration elsewhere, we would agree with Kormann that inflamma-

* "Ueber Retropharyngeal Abscess bin Kindern," *Jahrb. für Kinderheilkunde*, Wien, 1857, 1876, und 1881 (durch Alexy).

† "Des Abscès Retropharyngiens," Genève et Basle, 1870.

‡ "Diseases of Children," Am. ed. 1882, pp. 59.

§ Trans. Laryngol. Soc., 1884.

|| Loc. cit.

tion arising primarily in the glands is very rare, and that both the chronic swellings of the glandular tissue and the acute abscess-forming lymphadenitis are not really idiopathic, but are the result of morbid processes occurring in either the mucous or serous membranes of one of the cranial cavities.”*

Chronic rhinitis and inflammation of the mucous membrane in the neighborhood of the fauces appear to act as exciting causes, and there can be little doubt that those constitutional states which predispose to inflammation of the lymphatic glands in general have an important influence. Of these the scrofulous diathesis is by far the most important. Hereditary syphilis has been noted only in a few cases. A certain percentage of cases have been recorded as occurring after scarlet fever, measles, and other specific fevers. In such cases prolonged or severe inflammatory condition of the nasal mucous membrane appears to favor the occurrence of abscess. Dr. Lewandowsky, in an interesting paper,† gives the history of two cases occurring after scarlet fever. In the first case, the infant, a year old, was taken ill with what was apparently a not very severe type of the disease, although two other children in the house had died of the malignant form. There was early severe inflammation about the posterior nares, but the fauces did not suffer severely. Convalescence was slow and variable. In the fourth week from the onset, without any special symptoms, a fluctuating swelling was noticed to the left of the median line of the pharynx. An incision was made into it, and about half an ounce of thin, purulent matter escaped. This was followed by rapid recovery. The second case was that of an infant of seven months. The catarrhal symptoms in the fauces were slight, but there was a copious muco-purulent discharge from the nares. Convalescence proceeded slowly, when, on the tenth day, a peculiar snorting respiration came on. On examining the fauces a swelling was seen, which fluctuated on pressure. An incision was made into it, and pus escaped. The infant soon recovered completely. The author remarks on these cases that they were on

* *Lehrbuch der Kinderkrankheiten*, Dr. Adolf Baginsky, 1887.

† *Berliner Klin. Wochenschr.*, No. 8, February 20, 1882.

one side only. They ran a subacute course, and presented none of the symptoms of suffocation or dysphagia, which occur in more acute cases. On this account they were liable to be overlooked. The frequency of the occurrence of such cases appears to be variable, for Dr. Schmitz did not find one case in four hundred and fifty cases of scarlet fever in the St. Petersburg Children's Hospital, while Dr. Bokai gives seven cases out of six hundred and forty-four cases in the Children's Hospital in Pesth. Violent phlegmons of the throat appear rarely to give rise to this form of abscess, but suppuration in the tympanic cavity in children is pointed out by Wiel* as a not infrequent cause. Dr. Roe, quoting him, reports the case of a child, nine months old, that died from secondary œdema of the larynx. On post-mortem, suppuration in the ear was shown to have been the cause of the abscess. This same cause is referred to by several other writers.

The great majority of the cases of retro-pharyngeal abscess occur during the winter and spring months, probably because in those seasons catarrhal affections of the nose, pharynx, and middle ear are most common.†

The abundance of glandulæ in this situation has long been recognized, but to Dr. Edmund Simon‡ we are indebted for our exact knowledge of the lymphatics of this region. He describes them as forming small net-works on either side, which terminate in glands located one on each side of the median line, between the superior constrictor and the aponeurosis of the prevertebral muscles. After the third year of life these glands are said to disappear altogether,—a fact which, if corroborated, would indicate a close connection between the time of activity of these glands and the period when abscess is most liable.

Kormann, quoted by Eustace Smith, states that with his finger he has been able to detect enlargement of these glands in inflammatory affections of the pharynx and nares, and Bokai, in his statistics, adds that, in addition to the above

* Monatschrift f. Ohrenheilkunde, Berlin, 1881, Bd. xv. s. 43.

† Baginsky, Lehrbuch der Kinderkrankheiten, s. 622, Braunschweig, 87.

‡ Schmidt's Jahrb., Bd. cvii. s. 161.

quoted cases of abscess, he noticed sixty-three cases of lymphadenitis that did not terminate in suppuration.

The symptoms which should attract our attention are dysphagia, or inability to swallow, dyspnœa, cough, alteration of the voice, with, in most cases, more or less stiffness of the neck. This latter in infants frequently escapes notice. If the abscess has been allowed to attain any size, some fulness behind the angle of the jaw may be detected. The symptoms will vary a good deal with the position of the abscess. If principally in the upper part, deglutition will be mainly interfered with; if it extends lower, respiration will more or less suffer; while, if it be still lower, becoming post-œsophageal rather than post-pharyngeal, there may be little or no alteration in either, and the diagnosis will be very obscure. The dyspnœa is generally worse when the infant is in the recumbent position. Dr. L. M. Politzer,* of Vienna, says that a strongly-marked nasal or palate sound in an infant's or child's voice should always lead us to suspect and examine the pharynx for abscess; and Duparcque† states that in those cases where the abscess is seated so low down that it cannot be seen or felt, the voice assumes a shrill tone, and pressure made on the larynx or trachea produces severe pain, and sometimes entire suspension of respiration. Dr. Goix adds that the normal lateral gliding movement which the posterior edges of the thyroid have on the vertebral column is lost in retro-pharyngeal abscess, but may persist when the abscess occupies the retro-laryngeal space.‡

The amount of pain, pyrexia, and general disturbance depends somewhat on the course, whether acute or chronic, which the disease assumes. In the more acute cases the onset is sudden, and is frequently marked by vomiting or convulsions; the pain is severe; the fever is sometimes of a high grade, and the symptoms above referred to are pronounced. In those that run a more chronic course the onset is often insidious, the general disturbance much less, and the local symptoms are less

* Am. Journal of Obstetrics, vol. xvii. p. 553.

† Annales d'Obstétrique, December, 1842, p. 242.

‡ Archiv. Gén. de Méd., October, 1882.

urgent. A somewhat remarkable instance of this insidious and chronic course is related by Dr. Eustace Smith,* where a child of three years was brought to the hospital for difficulty of breathing. The infant, when one year old, had suffered from enlarged glands in the neck, which went on to suppuration. Shortly afterwards the child's breathing had become oppressed, and respiration had been accompanied by a peculiar whistling noise, always worse at night. It had remained in this condition ever since. On examination, a swelling was seen at the back of the pharynx, which was punctured, and thick pus escaped. The child was promptly relieved.

Among the curiosities of the literature on the subject is the case quoted by Dr. J. Lewis Smith of an infant who died at the age of nine weeks, with the history of always having had much difficulty in nursing and swallowing. On post-mortem an abscess, with thick and firm walls, was found in the retro-pharyngeal tissues.

But the notable fact with which one is impressed on reviewing the literature is the frequency with which these cases remain undiagnosed, or receive a faulty diagnosis, sometimes till spontaneous rupture takes place, or death ensues either by inanition or suffocation. A few cases are reported where the abscess was not discovered till after the children had ceased breathing, but on opening it immediately, and employing artificial respiration, they recovered. The symptoms may resemble, and be mistaken for, those of catarrhal laryngitis, membranous croup, œdema of the glottis, and perhaps tonsillitis or a foreign body in the larynx. In all cases where the symptoms are suspicious, a careful inspection should be made in a good light, and followed by careful but gentle palpation. The index finger should be passed first to the back of the pharynx, then up behind the soft palate to the naso-pharynx, and afterwards down as far as possible behind the larynx. None of these manœuvres are always easily managed in infants with narrow buccal and pharyngeal cavities. Mucus and regurgitated milk are liable to prevent thorough inspection, and the movements of the finger in the pharynx may give rise to severe attacks of

* "Diseases of Children," New York.

suffocation, and, as Fleming has remarked, even to convulsions. Yet it is our only resource, and the attempt should be renewed. In such cases there can be little objection to quieting the child with a few whiffs of chloroform, or, preferably, a mixture of ether and chloroform.

The tumor, if seen early, is hemispherical or oval, and is generally situated a little to one side of the median line, and fluctuation in it can usually be made out. If desired, it may be opened while the infant is under the anæsthetic, provided due precautions are taken to prevent the entrance of pus into the larynx.

In regard to treatment, there is but one correct course, and that is early incision. If this is postponed, pressure symptoms are liable to become serious at any moment, or should the abscess burst spontaneously, death by suffocation is liable to occur, especially if the rupture takes place during sleep. Hensch* mentions a case in which a colleague desired to keep the child until the following day for demonstration, but paid for the delay by the death of the child by suffocation in this way during the night. Similar cases are reported by different writers. Perhaps the safest way of opening the abscess in children is to draw off the greater amount first by aspiration, then afterwards to relieve the remainder by a vertical incision. Others recommend the use of a large trocar and canula. Excepting, however, those cases where the abscess is very large, or low down, out of convenient reach, a well-guarded bistoury, in the absence of a pharyngotome, passed in along the edge of the finger, answers the purpose, but care should be taken to bend the head of the child quickly forward, so that the pus may run out of the mouth. The bistoury must be guarded to near the tip. Schmitz,† quoted by Roe, tells us of a case he attempted to open with a bistoury, when the tongue of the child slipped from under his finger and was severely cut. Copious hemorrhage ensued, and the life of the child was endangered.

If there is any tendency to pointing externally, Chiene's or, more properly, Hilton's proposition to open it externally should be adopted; and there is no better method than that adopted

* Loc. cit.

† Jahrb., f. Kinderheilkunde, Leipzig, 1872, 1873.

by Dr. Shepherd in my third case. When the opening has been made in the pharynx, West's suggestion to make pressure daily with the finger to evacuate any pocket of the pus is a good one. The child's diet had better be confined to milk entirely, while appropriate remedies are given for the general constitutional condition.

THE METHOD OF NURSING SICK CHILDREN.*

BY WILLIAM A. EDWARDS, M.D.,

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So much has been written upon infancy and the disorders of early life that I am tempted this afternoon to address you upon a no less important subject that has been comparatively neglected. By childhood we understand a period in life between the complete eruption of the milk teeth, usually at the end of the second year, and the establishment of the series of changes known as puberty. This time of life is peculiarly rife in many disorders that will require the ministrations of that greatest of all comforts to an invalid, a skilfully-trained nurse, upon whose intelligence, acumen, and ability the little sufferer absolutely depends for its well-being and future prospects of a sturdy frame and a sound mind. Only those who have had personal experience in the comfort to be obtained by the attendance of a nurse who thoroughly understands her chosen life's work can appreciate the aid that skilful nursing renders the physician in guiding the case to a successful termination. Indeed, as West says, "If any of you have entered upon your office without a feeling of very earnest love for little children, a feeling which makes you long to be with them, to take care of them, to help them, you have made a great mistake in undertaking such duties as you are now engaged in."

* A Lecture delivered before the University Training-School for Nurses.

Diet.—Considering as we are the manner of nursing children of three years of age and upward, it is unnecessary to refer at all to the regimen of infancy, a subject which you all know has been most fully elaborated within the last decade. Let us first determine what food is proper for a child, and in this way establish a basis for comparison for our standard. We will adopt the diet-table of the Northeastern Hospital for Children, London, which is prepared for a child of seven years :

Diet.

	Milk Diet.	Fish Diet.	Full Diet.
Breakfast, 7 A.M.	Milk, $\frac{1}{2}$ pint; bread, 2 ounces, with butter.	Milk or cocoa, $\frac{1}{2}$ pint; bread, $2\frac{1}{2}$ ounces, with butter.	Milk or cocoa, $\frac{1}{2}$ pint; bread, $2\frac{1}{2}$ ounces, with butter.
Dinner, 12 M.....	Milk, $\frac{1}{2}$ pint; rice or other milk pudding.	Fish, boiled, $2\frac{1}{2}$ ounces; potatoes, mashed, 3 ounces; bread, 1 ounce; milk pudding.	Roast, boiled, or minced mutton, or roast or minced beef, $2\frac{1}{2}$ ounces; mashed potatoes, 4 ounces, to alternate with green vegetables; bread, 1 ounce; milk pudding.
Tea, 3.30 P.M.....	Milk, $\frac{1}{2}$ pint; bread, 2 ounces, with butter.	Milk, $\frac{1}{2}$ pint; bread, $2\frac{1}{2}$ ounces, with treacle or butter.	Bread, $2\frac{1}{2}$ ounces, with butter, treacle, or dripping; milk, $\frac{1}{4}$ pint.
Supper, 6 P.M.....	Biscuit (cracker) or slice of bread and butter.	Bread, 2 ounces, with butter or cracker.	Bread, 2 ounces, with butter or cracker.

NOTE.—The diet for fever patients to consist of milk and beef-tea, given at stated intervals, as directed, to the extent of one-half pint to one pint of beef-tea and two pints of milk in twenty-four hours. The beef-tea should be made as follows : Using one pound of beef to one-half pint of water. The beef to be cut up very small, and to be placed in a vessel with cold water from two to four hours, and then this vessel to be placed in another larger one, containing boiling water, for an hour or more. Finally, strain and squeeze through muslin, and thicken with gelatin, if so ordered.

The diet for a child, while it must be plain, must also present a variety, and after the child has reached its fourth year, eggs, minced chicken, properly roasted, and scraped beef may be added to the diet-list. Thoroughly ripe and undecayed fruits may also be allowed. Occasionally ice-cream in small quantities may be added by way of variety. Macaroni will be found to be nutritious and acceptable, as will also hominy and spinach. Particular care must be exercised to avoid high-seasoned food or made-up dishes,—that is, remnants from the day before. Fried food is to be absolutely denied. Spirits of all kinds—malt liquors, tea, and coffee—are not allowed. Weak cocoa, milk, and filtered water are the only drinks that are to be used until after puberty. Allow

the child to eat enough at each meal to satisfy its hunger; more than this will do harm. Eating between meals is responsible for many of the gastro-intestinal disorders of early life; the habit should never be allowed to be formed, and, if it exists, should be broken as soon as possible.

Diseased conditions will require many modifications in the diet-table to meet the impaired digestive function and the deranged assimilation. Should the milk not agree well with the child, and apparently fail in providing sufficient nutriment through malassimilation, it may be prepared in accordance with the following directions, suggested by J. M. Keating, which is known as milk-food tablets or powder:

Sugar of milk.....	26 grains.
Calcis lactophos.....	$\frac{1}{6}$ grain.
Calcis carb.....	$\frac{1}{12}$ grain.
Sodii bicarb.....	$\frac{1}{2}$ grain.
Potass. bicarb.....	$\frac{1}{12}$ grain.
Sodii chloridi.....	$\frac{1}{6}$ grain.

These can be made up in large quantities, put in cans or wide-mouthed bottles, and are to be used as follows:

To prepare the bottle for a child about a month old or younger, take three ounces of boiling water and stir in one ounce of ordinary milk; to this add three tablets and dissolve thoroughly; place the mixture in a nursing-bottle and add two tablespoonfuls (one ounce) of good, fresh cream; shake well, and give to the child at about the temperature of the body.

For a child two or three months old, prepare the bottle as follows:

Take two ounces of water (boiling) and stir into it two ounces of good, fresh, ordinary milk (if the child is of a constipated habit, they need not boil together); then dissolve into the mixture four tablets; pour this into the nursing-bottle, and add one ounce of fresh ordinary cream; shake well.

If the child's stools contain a mass of curds, showing deficient digestion, it would be well at once further to dilute the milk. Should this not be sufficient, a small quantity of malted food, such as Mellin's or Horlick's, a teaspoonful to the bottle,

can be added to stimulate the digestive functions. If this fail, then use *peptogenic* milk-powder, and predigest the curd; and, finally, if still unsuccessful, put the child on condensed milk.

The white of eggs, lime-water, and milk make an acceptable and a nutritious combination. The various preparations of predigested food play a most important rôle in the sick child's dietary, as you know; milk, milk-gruel, milk-punch, effervescing milk-punch, beef-tea, and oysters may all be prepared in this manner.

Raw beef-juice, beef-tea, consommé, chicken-, mutton-, or veal-broth are preparations upon which we must often place absolute dependence in severe cases of illness in which the conditions present demand a concentrated and nutritious diet. Among the farinacea which experience has taught us are reliable are rice-pudding, tapioca, sago-jelly, oatmeal-gruel, hominy, arrow-root pudding, rice and milk, flaxseed-tea, barley-water, toast-water, flour-ball, or oatmeal-water. Combinations of milk and gelatin, cream and gelatin, milk and wine, as wine-whey, egg and brandy are methods of tiding the sick child over periods of exhaustion and weakness that are alone to be combated by supplying sufficient nutriment in an acceptable form to sustain life until the disease has run its course.

We must not forget the efficacy of nutritive enemata, by which means we are often able to prolong life, and even sometimes to save it. Predigestion is here a matter of great importance, but the enema must be small (about two to four ounces) and must be given sufficiently often to sustain life, at intervals of not less than four hours. The lower bowel must contain no fæces. It is often necessary to first evacuate it by a simple warm water enema. A few drops of laudanum may be added to the nutritive enema to assist its retention. Much care must be exercised to guard against injuries to the rectum. Nordmann has recently published a description of twenty-five bowel lesions due to the operation of administering enemata. They include three complete perforations and ulcers and wounds of various sizes and depths. The best syringe for nutritious enemata is the one that I exhibit to you.

Peptonized beef-tea, milk, beef-tea and brandy, egg and

milk, beef-tea, cream, and brandy are all useful combinations for sustaining life.

Temperature.—By experience one is able to estimate the amount of rise in temperature with an astonishing degree of accuracy by simply placing the hand upon the skin ; but of course one should not rely upon this off-hand manner, but should have recourse to an accurate clinical thermometer, which may be in the young child introduced into the rectum, in a somewhat older child in the armpit, and in one of sufficient intelligence in the mouth. In the first instance it is necessary that the lower bowel be free from fæces. The child should lay upon its back in the nurse's lap, who is to elevate and control the legs with the left hand and guard the instrument with the right. Should the thermometer be introduced into the armpit, the nurse must see that the skin is dry and all moisture removed. Should the mouth be selected, then the child must breathe entirely through the nose. It will require for registration five minutes each for the rectum and armpit, and from three to four minutes for the mouth. You must bear in mind that different portions of the body present different degrees of normal temperature ; for example, with 98.5° as the standard the rectal temperature will be 99.5° or 100° in a young child, and that in the mouth will be about 99° or 99.5° . A knowledge of these facts may save you and the anxious parents many moments of suspense. Remember, also, that the temperature of the growing child may be affected by the most trivial conditions. A slight digestive derangement, an almost unnoticed catarrh, may produce a rapid elevation, which, if we consider alone the number of degrees recorded, would be a cause of grave alarm ; but the rise is only temporary, and will speedily be succeeded by a return to the normal. This peculiarity of childhood must always be remembered by those engaged in their care. Not so, however, is a sudden fall in temperature. A record below 97° in a child is a prognostic sign of very evil omen ; it is always noted in collapse, and precedes death. In grave cases of entero-colitis or cholera infantum the temperature may even be below this point, and in congenital heart-disease with impending dissolution, I have observed it with a lower registration.

The pulse.—The pulse of the young is affected to a marked degree by the so-called functional disorders, and of these abnormalities in its action, alterations in the rhythm are by far the most frequent. As we have before remarked, functional disorders of the heart's action, irrespective of inflammation or structural lesion of any kind whatever, constitute a frequent and an important class of cardiac diseases in the growing child.

A persistent frequency of the pulse is usually due to cardiac overstrain from continuous exertion; it is also a concomitant of neurasthenia and the abuse of certain articles, as tobacco, tea, coffee, or alcohol,—the so-called toxic cases.

Persistent frequency is seen in anæmic and leukæmic cases, also in malarial poisoning. Alterations in the blood crisis, anæmia, leucocythæmia, melanæmia, and pernicious anæmia have as a constant attendant great irregularity of the heart and pulse; the younger the child the greater the irregularity.

The strength of the pulse in childhood is never a constant quantity until about the age of fourteen is reached; before that time it has not established its equilibrium, and is easily affected by the most trivial departure from health,—even a slight accumulation of flatus, for example, will convert the perfectly-normal pulse of the infant into a rapid-running pulse that at an older period of life would be indicative of grave disease.

We may, in an off-hand manner, estimate the strength of the pulse by placing several fingers on the radial artery and one or two nearer the heart, and thus estimate the degree of pressure that will be required to obliterate the radial pulsation.

Neurotic influences often produce extreme palpitation of the heart, with a pulse-rate far above the normal; the pulse under these influences gives one the impression of but little onward movement of the blood; it seems more to vibrate than to pulsate. At a later period of life this condition is alarming, and sometimes is the precursor of death.

We do not find in children the same intense lividity and general capillary congestion of the face and extremities as we do in adults, but, on the contrary, intense pallor of the skin and mucous membrane exists; for a short time preceding death the pallor may become a light violet hue.

THE PULSE IN VALVULAR DISEASE.

Mitral regurgitation.—Great irregularity of pulse is almost diagnostic.

Mitral stenosis.—Until heart-failure arises the pulse is small and regular, but as soon as compensation fails irregularity at the wrist arises. Although for a time the præcordial pulsations may continue to be regular, eventually extreme irregularity both in cardiac and arterial action arises, as Broadbent most aptly remarks; finally, the irregularity of the pulse and its lack of correspondence with the irregular heart defy description.

Aortic stenosis.—Should a child present this pulse in its typical form it is most characteristic, the wave is gradual in onset and long in duration, due to the narrowed condition of the valves; it is also small, and at once gives to the observer the impression of want of impact or strength. But rarely, however, do we meet this pulse in its purity, as aortic stenosis is so apt to be complicated by regurgitation at the same valve. We have elsewhere presented a case of pure aortic stenosis with pulse-tracing in a child, aged six, on whom an autopsy was held.

Aortic insufficiency.—If we exclude cases of congenital origin, primary regurgitation at the aortic valve is rare in childhood. Corrigan has made this pulse almost historic in medicine, and it is not necessary for us to dwell upon its characteristics now, particularly as we have fully elaborated its peculiarities in another publication.*

Puberty.—In a temperate climate menstruation usually appears at the fourteenth year, but its appearance depends on many conditions, as family peculiarities, social position, race, and occupation. So that it may appear several years earlier or a year or so later. Its appearance is preceded by a series of changes which are characteristic, and frequently require the ministrations of one whose education may prevent present suffering and years of invalidism. At this time chorea, night-terrors, mental disturbances, and gastro-intestinal derange-

* "Diseases of the Heart and Circulation in Infancy and Adolescence."
By John M. Keating, M.D., and William A. Edwards, M.D. P. Blakiston, Son & Co. 1888.

ments may arise as evidence of the systemic change which has taken place, and, as you know, the child may become languid or peculiar in her disposition, shunning society, with fits of temper, loss of appetite, and some despondency. All these derangements must be combated by the child's advisers. The general health of the child must be seen to; a daily morning sponging with tepid water and a cold douche, followed by active rubbing with a Turkish towel until the skin glows, to be followed in a half-hour by a breakfast consisting of cocoa or warm milk, a rare steak, a broiled chop, with either oatmeal or breakfast hominy, will start the day right. For the little patient a noonday dinner, consisting of a nutritious soup, rare meat, and fresh vegetables, is to be followed by an early supper of milk or cocoa, and bread and butter. The patient is to retire early, and not spend the evening in reading novels. She is to take sufficient out-door exercise, short of fatigue, and the school hours are to be limited to the mornings. Massage or calisthenics may with advantage be added to the daily *régime*. The patient, after a course of such treatment, is in a condition where nature can assert itself, and the functions will probably be performed with regularity and ease, but the girl should understand that many months are usually required to establish its regular periodicity. She should also understand that the normal return may be in different individuals of different duration. For example, every twenty-five to twenty-eight or thirty days.

In conclusion, I beg you to bear in mind that in the management of sick children you will meet the most difficult task in your life's work, one that will require all your skill, fortitude, and forbearance. It will be necessary for you constantly to assert all the womanliness of which you may be possessed, so that by many and numberless acts of kindness you may so endear your little patients to you that your necessary ministrations will be those of love, and not simply the acts of a nurse to a patient. "To thine own self be true, and it doth follow as the night the day thou canst not then be false to any other."

REPORT OF SEVEN CASES OF DIPHTHERIA TREATED WITH A SPRAY OF HYDRONAPHTHAL, PAPAÏN, AND HYDROCHLORIC ACID.

BY W. C. CALDWELL, M.D.,
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ASSUMING the probable truth of certain propositions which I shall soon state, suggested the treatment used on these seven cases.

These propositions are :

1. It is probable that diphtheria, at first like wound and puerperal sepsis, is a local disease, and that the temperature is due to the absorption of leucomaines. It is probable that later the microbe of septicæmia, and possibly the microbe of diphtheria, may enter the blood and produce a general disease, the temperature being due in part to the leucomaines produced by the microbes which are multiplying in the blood and lymph.

2. It is probable that the pseudo-membrane is over the site of local primary infection, and that in it and specially beneath it in the lymph spaces of the submucous tissue are the invading bacteria of diphtheria.

Hence, if diphtheria is at first a local disease, and later may become a general disease, either a septicæmia or diphtheræmia ; and if this local infection is accompanied by a pseudo-membrane which covers over the invading bacteria, the indications for treatment are the prompt, frequent, and effective application of remedial agents which will,—

First.—Remove the pseudo-membrane, so that the bacteria can be reached ; and,—

Second.—Arrest the growth of the bacteria.

For convenience I prescribe these drugs in the same mixture ; but it should be remembered that they must not neutralize each other's actions, or in any way be incompatible. An antiseptic and peptonizing agent might act powerfully when used separately, but might be inactive when in the same mixture. Pancreatin is an active peptonizer, but it can only be used with an antiseptic which can act in an alkaline men-

struum ; hence, it cannot be used with bichloride of mercury. I have not tried pepsin in combination with an antiseptic. Papain acts in an acid, neutral, or alkaline menstua, and hence it is more available for combination. Bichloride of mercury is a powerful antiseptic in neutral and acid menstua, but it not only arrests the growth of the bacteria, but also, to a certain extent, the peptonizing ferment. At least it has this effect in artificial digestion ; however, I used it with papain in one case of diphtheria for twenty-four hours. The pseudo-membrane was readily dissolved, and the temperature fell from 103° to 99° from 9 A.M. to 6 P.M. But there is another and far more serious objection to bichloride of mercury, and that is the danger of mercurial poisoning.

Hydronaphthal is also a powerful antiseptic which acts in either a neutral or acid menstua, and, besides, is not poisonous. I have made no experiments on artificial digestion in the presence of hydronaphthal ; however, when used with papain to spray the throat in diphtheria, the membrane rapidly dissolves.

The treatment of the seven cases which I shall report consisted of,—

1. Keeping the bowels open.
2. Ingestion of two to six ounces of milk every two hours. The papain probably greatly aids the digestion of the milk, for most of it is swallowed.
3. Spraying the throat every half-hour till temperature is reduced and breathing is easy ; then every hour, unless asleep. In these cases, when the spray was used thoroughly, the temperature fell in from four to eight hours. It is probable that the temperature was due to leucomaines only, and that had the treatment been delayed till there was general infection the spraying would have had much less effect on it.

It is no easy matter to apply the spray properly,—that is, to the site of infection. It requires three persons to spray the throat effectively, especially when the larynx is involved. One person firmly holds the child in a semiprone position ; another depresses the posterior portion of the tongue, rendering accessible the structures involved, both by lowering the tongue and raising the larynx ; and the third uses the hand-

atomizer rapidly for a few seconds. The child is then given a little rest, and this procedure is repeated several times.

The spray is almost worthless, even for diphtheria of the tonsils, unless the tongue is forcibly depressed, because the moment the spray strikes the palate and posterior portion of the tongue the reflex apparatus is stimulated and the anterior opening of the pharynx is closed. The child is bitterly opposed to such gagging treatment, and hence the whole procedure has to be done with more or less force, and to the loving mother it appears very brutal; but it is better than a funeral. I have seen no untoward effects from this violent exertion of the child, but it is probable that, after the infection becomes general, there would be danger of heart-failure and also too great exhaustion of the other vital functions.

The following is the prescription for the spray I used on these seven cases:

R Papaïn, \mathfrak{z} ii;
 Hydronaphthal, gr. iii;
 Acidi hydrochlorici dil., gtt. xv;
 Aq. destil., ad \mathfrak{z} iv. M.

The papaïn is not very soluble in water, hence sometimes it obstructs the atomizer; however, by shaking the bottle well before using, so as to suspend the undissolved papaïn, it can be used in an atomizer of moderate-size tubing with fair success. By adding four drachms of glycerin to the mixture the solubility is greatly increased. Since I thought of adding the glycerin I have not had an opportunity to try it on a case. The manufacturers say that the papaïn in watery solution loses its strength; but I have noticed no loss in twelve hours.

CASE I.—A robust boy, five years old. I was called at 9 A.M., about twenty-four hours after he was taken sick. Temperature was 103° Fahr. There was great swelling of the tonsils, on both of which there was false membrane; the cervical glands were also swollen. The patient lived near my office, and, as I was anxious to determine the action of the spray, I attended to spraying his throat every hour myself till 6 P.M., and at the half-hours the mother and assistants sprayed it. At 6 P.M. his temperature was 99°. After that I left it to the family, and on the following morning the temperature

was 102° , which rise was due to ineffectual spraying. After impressing them with the importance of it, the atomizer was used systematically, and in five days the symptoms disappeared.

CASES II., III., IV.—Three children, aged two, five, and seven years respectively; had very little temperature or other constitutional disturbance, except that the cervical glands were swollen, though the membrane extended over both the tonsils of the two older children. These three children were at no time sick enough to stay in bed, and all throat symptoms disappeared in four days, when treatment was suspended. There was no temperature to reduce; the spray dissolved the membrane, which would again cover the site of infection. These three cases were so mild that it is probable the course would have been the same without treatment. Diphtheritic paralysis was a sequela in the third case.

CASE V.—Patient a delicate girl, eleven years old. I was called at 10 A.M. on second day of the disease. Found the temperature $103\frac{1}{2}^{\circ}$; pseudo-membrane covering both tonsils and the soft palate. The family was instructed to use the spray every half-hour till the temperature was reduced. At 7 P.M. the temperature was the same, and the girl apparently worse. I explained the gravity of the case and the probable future, if they did not apply the spray as I had shown them. On the following morning the temperature was 101° , and the next evening $99\frac{1}{2}^{\circ}$. At the expiration of five days treatment was suspended.

CASE VI.—Boy, well nourished, six years old. I was called at 9 P.M., about ten hours after he was taken sick. Breathing was labored; could be heard all over the room; face flushed; voice hoarse; frequent but suppressed cough; temperature 100° . There was no enlargement of the cervical glands, and no inflammation or membrane could be observed by inspecting the throat. Auscultation revealed stenosis of the larynx. There was diphtheria of larynx. The spray was prescribed, and I explained to the family how to use the atomizer and the great importance of pressing the tongue down, so that it would reach the larynx; but when I called next morning I found the child with a temperature of 103° , rapid pulse, and greater dyspnoea. I sprayed the child's

throat myself, showing them how, and then told them that, if they valued the child's life at all, this must be done thoroughly every half-hour till breathing became easier and the fever reduced. The parents seemed to be impressed with this warning, and when I returned in the evening the boy was bright, breathing was natural, and his temperature reduced to 99.8°. The disease lasted six days.

CASE VII.—Boy, three years old. Mother said the child had been sick about one week with sore throat, but nothing alarming till within twelve hours, when breathing became difficult. I found the child cyanosed, his hands cold, and breathing obstructed in the larynx. On inspiration there was depression of the costal cartilages and the epigastric region. I sprayed the throat every fifteen minutes for two hours, but without the slightest benefit. I then proposed intubation, but they were unwilling to have that performed or even the spray continued. The child had no further treatment except an emetic, and died eighteen hours later.

The history of the treatment of these seven cases (though only a limited number) suggests the probability in other cases,—

1. That usually those in charge of the patient will fail in effectively applying the spray.

2. That before there is general infection the temperature will rapidly fall with thorough use of the spray.

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Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Heubner: Cold Water in the Acute Diseases of Children. (*Arch. di Patol. Inf.*, September, 1888.)

The indications for the use of this method of treatment and the principal precautions are given in this paper.

1. Envelopment with moist clothes serves as an excellent antifebrile agent. Local refrigerants will have a proportionately greater effect in children than in adults, since the trunk in children is relatively larger than in adults. The clothes

moistened in water at 16° C. may be laid upon the surface of the chest or the abdomen. For small children, envelopment of the back and chest will suffice. A covering of flannel or cotton wool may be laid over the cold cloth. If the temperature of the body has reached 40° C. cold compresses may be applied every half-hour during the day or during a portion of it. Cold baths of the entire body, or baths in which the temperature of the water is gradually lowered, will reduce the temperature of the body, but it will not be so permanent as is obtained by the other method mentioned. By gradually reducing the temperature of the water to 24° C. or 22° C. the bath may be borne from five to fifteen minutes, and the effect will last about two hours. Cold fomentations may be used in acute pneumonia, during the first week of typhoid fever, and the first week of scarlatina and erysipelas. These methods are not indicated in roseola and catarrhal disorders. In children two to four years of age cold cloths may be applied as often as every twenty or thirty minutes, the cloths extending from the neck to the legs, and the temperature of the water being 20° C. to 30° C. A layer of cotton may be placed over the cold compress, and after a few applications there should be an interval of at least two hours. This treatment should be used with great caution, lest collapse occur, and if it is deemed prudent to employ it, excitants should be used in the intervals. It may be used in the diseases before mentioned, also in meningitis, in the fever of angina tonsillaris, in fever attending dentition, and in insolation.

2. Water may also be used to provoke sweating. It may be applied for local hyperæmia, for pharyngitis, laryngitis, pleuritis, pneumonia, and diffuse bronchitis, by means of compresses or fomentations. Warm fomentations are useful in catarrhal affections of the larynx and trachea, the bronchi and lungs. In capillary bronchitis or catarrhal pneumonia, either primary or secondary to roseola and whooping-cough, they will produce diminution of the exudate in the small bronchi, relieve dyspnœa, and cause improvement in the heart action.

Consecutive to a tepid bath dry rubbing should be practised, and sweating may be further encouraged by the administration of alcohol. If mustard be placed in the water for the bath, the excitant effect to the skin will often be beneficial.

3. To increase in a reflex manner the excitability of the bulbar reflex centres, diminish intense fever, regulate the movements of the heart and the respiration, we have no more powerful means than cold affusions. Excellent results follow this treatment in atelectasis, bronchitis, catarrhal pneumonia, and cardiac weakness.

A. F. C.

Saint Philippe : Vesicants in Children, their Advantages and Disadvantages ; Complications which may arise from the Wound, and their Treatment by the External Use of Subnitrate of Bismuth. (*Rev. Mens. des Mal. de l'Enf.*, September, 1888.)

A Paris thesis of fifteen years ago called attention in vigorous terms to the bad results of unwise and improper vesication. Though many truthful statements were made in that thesis, it would be foolish to deny that vesication is a useful means of treatment under certain circumstances. Even the homœopaths admit as much. Especially is this so in the case of adults. In children there is a very decided difference of opinion as to the usefulness or propriety of vesication. It must ever be borne in mind that the aspect of disease varies with the different periods of childhood, and it is convenient to consider children as newly born, at the breast, weaned, five years of age, and ten to fifteen years of age, at which periods the same disease presents varying features. This fact will account for the varying result, and varying opinion too, in regard to the value of vesicants and vesication during childhood. In the author's opinion, the vesicant produces its best effect when used for broncho-pneumonia complicating measles, and it should be used when the complication appears, and not in the early stages of the disease (measles). Its effects, of course, are derivative and revulsive. In broncho-pneumonia complicating diphtheria, in cases in which tracheotomy has been performed, the author believes in the good effects of a blister, contrary to general opinion, unless the patient is already too much overcome by the poison of the disease. The author also believes in the propriety and efficiency of blisters in certain cases of inflammation of the serous membranes, in pericarditis, pleurisy, peritonitis, and meningitis. They are also useful to check obstinate vomiting, to relieve arthritis, ophthalmia, adenitis, and the initial condition of infantile paralysis. In all these cases, however, the author would use only the flying-blister, and for short periods of time only. The author refers also to the inconveniences of vesicants in children, and the accidents which they may cause. They are undoubtedly very irritating to the sensitive skin and the sensitive nervous system of children, and, if left *in situ* too long, they may even excite attacks of eclampsia. Again, if the vesicating substance be cantharides, its ready absorption may cause unpleasant conditions of the urinary apparatus and of the intestinal mucous membrane. These may take the form of painful and bloody cystitis, nephritis, entero-colitis, or intestinal colic. Vesicants may also cause trouble on account of

the wound itself made by them. Such wounds are susceptible of septic changes, and in poor and hospital children such changes not infrequently result. These wounds may become inflamed, they may become diphtheritic, ulcerated, or gangrenous.

With the foregoing statements in mind, one is prepared to prevent the occurrence of accidents from vesicants, and also to cure them if they should occur. In suspicious cases—that is, in children with whom several irritants are likely to do badly—vesicants must not be used. The possible bad effects of cantharides must be anticipated by giving the patient bicarbonate of soda, and thus keeping the urine alkaline. One must also be certain that the vesicant is not worn more than four to six hours, and that afterwards the wound is properly dressed. If, in spite of all precautions, ulceration takes place, the wound may be touched with tincture of cantharides, lemon-juice, nitrate of silver, perchloride of iron, tincture of iodine, or tincture of eucalyptus. If it is necessary to use germicides, one may choose from carbolic, thymic, salicylic, or boric acids, or sublimate. One may also use iodoform or carbolated or camphorated oil in connection with Lister dressings. Better than either of the foregoing is a dressing of subnitrate of bismuth, which has been tried by the author in very many cases, and always with satisfaction. It should be used freely, and it acts as a sedative and anæsthetic. It also acts rapidly, inoffensively, and with certainty.

A. F. C.

Biedert: The Normal Digestion of Milk. (*Jahrb. f. K.*, xxviii. 3 and 4.)

The following propositions represent the author's paper:

1. When human milk bears a certain relation to the acid of the stomach the casein will remain in solution and can be immediately absorbed. Ordinarily, the casein is coagulated in the stomach, and the fat-drops, which are included in the coagulum, require conditions which will enable them to be digested.

2. The proof of casein in the stools of children, which is obtained by extraction with hydrochloric acid, is a result which is entirely unsatisfactory.

3. Hitherto the casein element in the stools has been quite underestimated. The method of extraction with carbonate of soda shows that there are considerable quantities of casein in the stools of children who are fed upon cows' milk.

4. The conclusion which is made, that the casein in cows' milk is readily digested because so small a portion or remnant is found in the stools, is not correct.

5. The proofs that have been given of the chemical peculiarities and greater digestibility of human casein, when compared with cow casein, are established, and are confirmed by the difference in the development of children under a diet of human milk and cows' milk.

6. The decided difference as to the appearance of the evacuations under the two conditions is also noteworthy, cows'-milk stools being more abundant and offensive and having an alkaline reaction, for all of which the casein is more or less responsible.

7. The greater quantity of salt and calcium in the cows' milk is not chiefly responsible for the alkaline reaction of the stools, but the cheese element in the cows'-milk stools is in part related to the calcium which is in combination with it, but chiefly to the alkaline putrefactive products of the cheese.

8. The acid condition of the ordinary mother's-milk stools, and of cows'-milk stools on certain occasions, is probably due to the metamorphosis of the albumen bodies and the abundant presence of fat and its products of decomposition.

9. Green stools, according to Pfeiffer, are, as a rule, not acid. The reaction of these and other stools which indicate a diseased condition is due to circumstances similar to those which have been mentioned.

10. The satisfactory development of very small or diseased infants, with weak digestive powers, when fed on mothers' milk, is due to the ready absorption of the casein high up in the intestine. Cow casein, on the other hand, is utilized to a far less extent, and is much less advantageously disorganized.

11. Only this control of digestion by means of chemico-physical conditions permits the favorable effects which often follow dilution and mixture of the food.

12. That portion of food which is undigested by normal means, and must be subjected to extra chemical conditions, becomes the subject of more or less harmful disorganization under the influence of the fungi in the digestive tube, and thus becomes a focus and cause for the intestinal diseases.

13. Such breaking up of the albumen in changeable matter may become a cause for a deficiency of nitrogen in a comparison of the tissue-changes, especially in children brought up on cows' milk.

14. The so-called exact digestive trials in normal children, brought up on cows' milk, has only a limited value, because only those whose organs do well are interrogated.

15. The testing of a nutrient material which shall fully take the place of mother's milk must be made in a large series of cases in which the patients are in the first few weeks of

life, if indeed it be not necessary to try it with those who are also diseased, in order to make the test as complete as possible.

16. The author's limited experience with sterilized milk has completely proven its excellence, and confirmed all his earlier views as to the necessity of thus preparing it, not only on account of its difficultly-digestible cow casein, but also on account of its combination with other matters not readily digested.

17. The farinaceous preparations produce good results only as means for combination with and breaking up of milk albumen, and perhaps also milk fat. But they act favorably only in exceptional cases and only for a short time.

18. The behavior as to harmfulness or usefulness of certain nutrient substances in the digestive tube of children is also dependent upon the anatomo-physiological condition of the organs in each child, especially in the case of children that are diseased.

19. As to the fate of those substances which are not appropriated by the digestive organs, it matters much whether they have been carefully sterilized before being introduced into the stomach. The more thoroughly this has been accomplished, the longer deferred and less injurious will be the decomposition which is produced among them by intestinal bacteria, and therefore the less potent will they be in acting as causes of intestinal disease.

20. The more bacteria introduced with food which is already more or less decomposed the more rapid and intense will these disease-producing processes be.

21. The investigation of the bacteria referred to, in connection with Escherich's studies concerning normal intestinal bacteria, may give us an explanation concerning their significance in the production of disease.

22. It is probable that the products of the decompositions which are induced by these bacteria act as chemical incitants to disease. Organisms which are immediately pathogenic may, however, be developed and be effective in the injurious residue of the food which has been alluded to.

23. A suitable dietary must therefore include the greatest diminution possible of food which has an undigestible remnant, and also avoidance of food which has already begun to decompose.

24. The testing of a method of feeding does not consist in intruding it as a substitute for the methods which are in common use with the public, but in carefully trying it in comparison with methods which have already been established upon scientific foundations.

25. It must therefore be tried with many children, and

under manifold conditions, and must not be expected to solve the various conditions to which it may be subjected until after years of trial; even then it may not be possible or necessary that it should satisfy all of them.

A. F. C.

Korösi: The Opposition School to Vaccination in Vienna, and Statistics of Vaccination. (*Arch. f. K.*, x. i.)

The author has submitted the reports of the Vienna hospitals, with reference to their smallpox wards, to careful analysis, for the reason that Lorinser, Hermann, and Reitz, working in Vienna and St. Petersburg, have questioned the protective influence of vaccination, and have represented it as more or less imaginary. Some of the hospital reports which were analyzed were found worthless, because no distinction was made in them with respect to age. These reports showed only how many vaccinated and how many non-vaccinated persons had the smallpox, and how many died. The number of vaccinated who took the disease seems to have been greater than the number of non-vaccinated, but only a few adults in Austria belong to the latter class; and the statement may only verify what is sufficiently well known, that a single vaccination is not supposed to afford protection from smallpox for a lifetime. In some of the other hospital reports it appeared that those who had been vaccinated suffered less severely than those who had not, if they were attacked by smallpox, and the mortality among the latter in the Vienna hospitals was about three times as great as among the former. A more important argument in favor of vaccination is furnished by the report of Keller, chief physician of the Austrian State Railway, concerning the statistics of smallpox for the last seventy years. Keller's statistics include 3885 cases arranged with reference to the condition of vaccination, age, mortality, and other details. Of the 3885 cases of smallpox, 2069 had undergone vaccination, and of these 355 were under five years of age. Vaccination did not protect these children from a severe attack of smallpox, and 156 of the number died. These statistics furnish the strongest kind of an argument for the opponents of vaccination; but the fault may have been in the method of vaccination or the material which was used. The tables were carefully analyzed by the author, and the original reports reviewed as far as they were obtainable. By this means 644 authentic histories of cases of smallpox were obtained, of which 456 occurred in those who had been vaccinated, with 8.8 per cent. of deaths, and 148 in those who had not been vaccinated, with 32.3 per cent. of deaths. No vaccinated child under the age of one year died; of the non-vaccinated, during

the same period, 28 died. Under the age of five years, 42 vaccinated children were attacked, with a mortality of 21 per cent., and 99 non-vaccinated, with a mortality of 31 per cent. If one assumes that more or fewer of these were cases of vari-cella, and not variola, the former being included, to a greater or less extent in Austria, with the latter, and that many of the vaccinated children who had sickened and died from the smallpox had been vaccinated at a time, perhaps, after exposure to the disease, when it could not be expected that they would get full protection from the vaccination; if all the foregoing is taken into consideration, then these statistics prove only the usefulness of vaccination. Reports of this character require, therefore, more than a superficial study before one accepts the teachings which they are intended to convey. A. F. C.

Huchard: *Digitalis in Pediatric Practice.* (*El Prog. Gin. y Ped.*, April 25, 1888.)

In principle it should be admitted that children tolerate digitalis well, on account of the integrity of the cardiac muscles, the blood-vessels, and the secretory or eliminative vessels, such as the liver and kidneys. Old people tolerate the drug badly, on account of lesions in the cardiac muscle and the blood-vessels, and a state of impermeability in the kidneys, or insufficiency in the liver. In old people, therefore, especially in those who are known to suffer from arterial sclerosis, digitalis should be given with caution and in small doses. In children, on the other hand, digitalis should be given for very short periods, for cardiopathies among them are known to exist for a long time in a latent condition in which the physical signs are not pronounced. In such cases the cardiac impulse may continue to be energetic for a long time, the pulse may be strong, and disorders in the peripheral circulation together with phenomena of cardio-vascular asthenia may appear slowly. From this it follows that digitalis should be prescribed with great caution, especially when it is given for the relief of asystolie. Even in cases in which digitalis seems to be well tolerated by children it is well to follow the rule that, in children, toxic medicines should be given in very minute doses, their physiological effects should be carefully watched, and their use should be suspended at the earliest possible moment. Digitaline should not be given to children, especially in its crystalline form. The infusion of digitalis may be given in doses of five to ten centigrammes of the leaves to one hundred and fifty grammes of water. The extract of digitalis may be given in doses of one to two centigrammes to children under two or three years of age, in doses of five centi-

grammes to those of five years, and in doses of ten centigrammes to those who are more than five years of age. Of the alcoholic tincture five to ten drops may be given to those under three years of age, and ten to fifteen drops to those from three to five years of age; twenty drops to those who are more than five years of age. A. F. C.

Pierron: The Use of Emetics and Purgatives as Internal Revulsives for Children. (*Jour. de Méd.*, September 23, 1888.)

The use of internal revulsives in children is attended with great benefits, the action being directed to the stomach or the large intestine. Not only are the derivative results useful, but paroxysms of the cough become less frequent and severe, dyspnoea less intense, and the febrile state less pronounced. Emetics are indicated in all broncho-pulmonary affections in children, especially at the beginning of the disease. A single emetic may relieve a beginning bronchitis, a pulmonary congestion, or a threatening asphyxia; but such treatment is seldom indicated for weak and anæmic children. In chronic conditions emetics often serve as general stimulants, and relieve the lung from the torpid state in which it may have been. A child does not expectorate before it is six to eight years of age, hence the usefulness of emetics in relieving the lungs and stomach of their abnormal contents. The number of available emetic drugs is small, and none is so efficient as ipecac. Since the syrup of ipecac is often inactive, Simon has suggested the following formula:

R Pulv. ipecac., 1 gramme;
Syr. ipecac., 50 grammes.

From a coffee- to a dessert-spoonful every ten minutes, with draughts of lukewarm water in the intervals.

The above formula may be made yet more active by the addition of one centigramme of emetine, the active principle of ipecac, and administering coffee-spoonfuls every ten minutes; but it should be given to very young children only when a physician is at hand. In tracheo-bronchitis, bronchitis, and pneumonia, especially if they are of diphtheritic origin, an emetic containing sulphate of copper is very effective.

R Cupri sulph., 5 to 20 grammes;
Syrupi simp., 20 grammes;
Aquæ, 100 grammes.

Teaspoonful or less every ten minutes, the dose varying with the age of the child, in children between one and seven years of age.

Other emetics which are useful in many cases are decoctions of polygala, violet root, and narcissus flowers. *Digitalis* is

also a nauseant with children. Vomiting may also be produced by mechanical means, such as tickling the throat with a feather, putting the finger or the handle of a spoon down the throat. Subcutaneous injections of emetine and apomorphine are not advisable for children, unless the case is urgent.

Purgatives may be administered either by the mouth or the rectum. In many cases it is preferable to give them by the rectum. Purgatives which are of use in the diseases under discussion are either evacuants—that is, mild laxatives without particular action upon the disease—or those which are intended to have an antiphlogistic action upon the disease. Many substances are available for this purpose; chief among them, and least harmful for children, is castor oil. Other useful agents are manna, rhubarb, magnesia, calomel, etc. The more energetic purgatives are given in such conditions as œdema of the lungs and whooping-cough, to relieve the organs of the excess of serum which they contain. Senna and scammony may be included in this category, and neither is given very frequently per rectum. Purgatives per rectum are indicated when the stomach is very weak and irritable, or when it is desirable to act upon the lower extremity of the digestive tube. Rectal injections may be mild, oleaginous, mucilaginous, or nutritive, or they may be more active and really purgative, for example,—

R Sodii chlor., 10 to 15 grammes;
Aquæ calidæ, 150 grammes.

Or the following:

R Foliarum sennæ, 4 grammes;
Sodæ sulph., 5 grammes;
Aquæ cal., 200 grammes.

Decoctions of senna should never be used per rectum for children. They might cause convulsions. A. F. C.

Calatraveno: Alimentation for Children when Lactation is Defective. (*El Prog. Gin. y Ped.*, October 10, 1888.)

The author's paper was read before the Pediatric Section of the National Gynæcological Congress recently held at Madrid, his conclusions being the following:

1. The alimentation of children during the first period of life is the greatest problem in pediatrics. According as the nutrition is good or bad do we obtain modifications of temperament and character, healthy and robust children or the opposite, and such as will be useful or otherwise to the community.

2. A bad alimentary regimen, and the abuse of milk and

farinaceous foods, result in malnutrition and death, with the appearance of the various symptoms which have been designated under the term athrepsia by Parrot.

3. No means of alimentation should be substituted for mother's milk during the first period of life. Mothers owe this duty to themselves not less than to their children, that they should nurse them, if possible. Those who have nursed their children are less susceptible to uterine and ovarian troubles than those who have not.

4. It is the duty of the physician to decide, in the families in which he is an attendant, what women are capable of nursing their children, and what ones are incapable, on account of debility or disease.

5. The best substitute for the mother's breast is that of a wet-nurse residing in the home with the child. But the antecedents of the wet-nurse as to syphilis, alcoholism, and scrofula must be clearly ascertained.

6. The nursing-bottle should be used if mother's breast and wet-nurse fail, but it must be used with the greatest care, absolute cleanliness and sweetness being indispensable, and only such mixtures should be used in it as will be entirely suitable and nutritious.

7. Asses' milk is most suitable if animal milk must be used; goats' and cows' milk may be used if the former cannot be obtained, being properly diluted with farinaceous food of proper character during the first few months of their use.

8. The entire class of advertised foods for children during the early period of life is to be rejected, this being especially the case with condensed milk.

A. F. C.

Baruch: Artificial Infant Foods. (*Dietetic Gazette*, July, 1888.)

From the fact that cows' milk contains bacteria in large numbers, and that it is difficult to free the milk of the micro-organisms, it follows that those prepared foods which require the addition of milk in order to render them fit for infants' nutrition are not adapted to the purpose of preventing gastrointestinal disturbances.

Condensed milk is obtained from large herds and brought to factories without any special attention (so far as the author is informed) to the destruction of micro-organisms. After cane-sugar has been added in large proportions, varying in the processes of different manufacturers, the milk is evaporated in vacuum-pans (hence not under high temperature) and prepared for market. Experience has demonstrated that condensed milk is not a good food for infants. Loebisch states that its chemical

components differ according to the state of concentration, the addition of cane-sugar, and the season of the year in which it has been manufactured, as well as according to the place from which it is sent to market. The fluctuation in composition is as follows: Water, 20 to 30; fats, 8 to 12; albuminoids, 10 to 13; milk-sugar, 10 to 15; cane-sugar, 30 to 45; salts, 15 to 30.

Children fed on a solution of condensed milk take on more fat, absorb more water into the tissues, and produce less blood and muscle. Hence they cannot resist disease, and while they appear well nourished, they are anæmic, lymphatic, and they readily become scrofulous if the tendency exists.

Another class of prepared foods are those starch and malted preparations which claim to form a good infant's food by their addition to cows' milk. As milk is the chief constituent of this food, the milk for this purpose should be thoroughly sterilized before being added to the "food."

A third variety of prepared food is the so-called milk food, consisting of desiccated milk, sugar, starch, and dextrin. These are the most important foods for infants to-day, because they furnish the essential elements of nutrition, chiefly derived from milk whose casein has been predigested and rendered more soluble by the addition of pancreatin and dextrin. Physiological justice demands that these foods contain no raw starch, if they are to be used for infants under six months; that they be supplied with an appropriate quantity of milk-sugar, and that the protein constituents be not less than those of human milk. The milk contained in these so-called milk foods should be gathered with the utmost care from properly-fed animals, transported with the least possible jolting to the factory, maintained during its transit in a low temperature, then transferred to an apparatus for sterilization, and immediately after the latter has been accomplished, reduced to the dry state, in order to prevent the formation of those organisms which Loeffler, Pasteur, and Lester have found to develop in fluid milk, after boiling, under an alkaline reaction. If such a preparation be put into air-tight and sterilized jars, all will have been accomplished that can be done to render the food sterile, and thus fulfil the chief indications in the prevention of the most serious gastro-intestinal derangements.

Edwards: *The Infant's Pulse.* (*Med. and Surg. Rep.*, October 20, 1888.)

It is with difficulty that the pulse can be recorded for the first hour after birth; sometimes not until ten days after birth can the pulse at the wrist be counted with any degree of accu-

ray. The first alteration in the pulse after birth is a decrease in its frequency; within an hour it will settle down to an average beat of 136, whereas before birth it has fluctuated between 124 and 150. During the first eighth- to quarter-minute after birth the heart-pulsations are not discernible; then they commence slowly, so that by the first half-minute they are probably not more than 10 or 12 per minute. At this time a vigorous child will cry, and the pulse-rate will become rapidly increased, possibly up to 160, settling down in a short time to between 136 and 140.

The infant's pulse is more rapid while it is awake, especially if it is sitting. Muscular or mental emotion may cause the pulse to become extremely rapid. As the child grows older the pulse becomes less impressionable; the child at six years presents an average pulse of 100, and at thirteen one of 88.

The most marked characteristic of the infant's pulse is irregularity, which occurs whether the child is asleep or awake, at rest or in active movement. An important and as yet unrecorded difference between the infant's pulse and that of the adult is the fact that in the former there is an entire absence of diastole, and it does not appear until the child has reached the tenth to fourteenth year.

Infants present great variations in the size of their arteries; in some of the diatheses the blood-vessels are much altered; for example, rickets is attended by large arteries. On the other hand, the arterial system may be unduly small. The character of the pulse in infants is difficult to describe; it yields readily to the finger of the observer, is small, irregular, and does not present any marked difference between systole and diastole.

While irregularity in rhythm may be considered one of the normal features of the pulse, it is not so, however, with persistent frequency, which is always a manifestation of cardiac overstrain, no matter how young the child may be; it also occurs in association with anæmia, leukæmia, and malarial intoxication in babes.

Occasionally in infants we meet with exactly the opposite condition,—namely, infrequent pulse, which is usually congenital, although he has several times observed an infrequent pulse associated with the jaundice that is common during the early months of life, and also with renal disorders. The congenital cases are liable to present also evidences of cerebral disturbances, great mental excitement, or epileptiform attacks.

II.—MEDICINE.

Smith, J. Lewis: Sepsis of the New-Born and Diphtheria of the New-Born. (*Medical News*, September 8, 1888.)

The author believes that the poison of sepsis of the new-born usually enters the system at the umbilicus; that it is of a microbic and not of a chemical nature. He divides cases of sepsis into three groups. In the first group he puts all cases of umbilical phlegmon, which is a local sepsis, the poison entering the system from an umbilical sore, and being conveyed by the lymphatics.

At the New York Infant Asylum seven cases have occurred since September 1, 1887, in which either local or systemic sepsis was diagnosticated. Diphtheria was epidemic at the time in the asylum, and five of these seven infants had diphtheria; of these five, two had umbilical phlegmon of a few days' duration when the diphtheritic exudate appeared upon the faucial surface. The question being as to whether the phlegmons were a local manifestation of diphtheria, or whether the umbilical phlegmon and diphtheria were distinct diseases, having a different microbic origin, the author reports the cases in full.

In the first case the phlegmon developed on the sixth day, the diphtheria on the ninth. The autopsy demonstrated that two forms of cocci were the septic agents that were received from the umbilical sore, some entering the thrombus, plugging the umbilical vein; others taken up by the lymphatics, entering the tissues which surrounded the umbilicus, and giving rise to the phlegmonous inflammation.

In the second case a small ulcer was observed in the umbilical fossa on the fifth day; from this centre the phlegmon gradually extended, reaching the ensiform cartilage above and pelvis below; on the evening of the sixth day the diphtheritic exudate was first seen; death occurred on the ninth day. The autopsy revealed diphtheria of the pharynx, larynx, and trachea, with double broncho-pneumonia, and localized septic inflammation of the umbilical vein and hypogastric arteries and the abdominal wall surrounding them.

He reports four other cases of phlegmon without any diphtheritic symptoms, all of which recovered.

In the second group the author puts those cases in which the septic poison probably entered the system through the umbilical vein. He reports five cases, all fatal, in which the umbilical vein was found patulous, and containing broken-down thrombi and pus. All of the cases had small collections

of pus in some other portion of the body; and each had a localized septic inflammation, as a pleuritis, endocarditis, etc.

In the third group the author places those cases in which the septic poison is received in some other way than through the umbilicus,—*e.g.*, through a sore located elsewhere.

The treatment the author advocates is dusting the navel with iodoform, the use of carbolized sweet oil one to thirty, and bathing the navel with corrosive sublimate solution, two grains to the pint.

The author states that diphtheria of the new-born is rare and the literature meagre. It appeared in the maternity wards of the New York Infant Asylum in January, 1888, and five cases are reported, of which four were fatal. In all of the cases the exudate extended into one or both nostrils, and in three of the fatal cases the pseudo-membrane was found covering the fauces, epiglottis, larynx, and trachea; in the fourth fatal case the diagnosis was bronchitis, nasal and slight pharyngeal diphtheria.

The author believes new-born children very susceptible to diphtheria, but advises a careful examination as preventing a wrong diagnosis.

Sulphur was tried for disinfecting, but with negative results. The author recommends strong corrosive sublimate solution for washing purposes, and to disinfect the air:

R Acidi carbolic, $\overline{\text{3j}}$;
Ol. eucalypti, $\overline{\text{3ss}}$;
Spts. terebinth., $\overline{\text{3vj}}$. M.

Add one tablespoonful to one quart of water, and place in a shallow vessel over the stove.

As regards the treatment of the cases, locally, corrosive sublimate solution, two grains to the pint, was used, and internally, the tincture of the chloride of iron, one to two drops frequently repeated.

Brainerd: The Identity of Diphtheria and Membranous Croup. (*American Lancet*, September, 1888.)

In discussing the question of the identity of diphtheria and membranous croup the writer presents the following propositions:

I. The etiology of the two affections is the same, whether we accept the bacteria theory or the theory of ptomaines as to the cause. Personally, he does not believe in the bacteria theory in diphtheria and croup, and the advocates of the theory do not agree among themselves as to which of the three or four bacteria found in the exudate is the causative one. If the bacteria be the cause, they are found in diphtheria and

croup alike. "There is no proof as yet that the micrococci are the cause of the disease" (Wood and Formad). Indeed, they are found in a perfectly-healthy mouth.

The doctrine of ptomaines supposes some virulent poisons, set free in the process of decomposition of organic matter, to be the causes of some diseases, as septicæmia. These bacteria, acting upon the pseudo-membrane, which is, of course, dead matter, doubtless effect its decomposition in such a way as to set free these animal poisons or ptomaines, and then they (the bacteria) serve as carriers of the ptomaines, the same as a bee carries pollen, or a letter carries scarlatina poison. Whichever theory we accept will afford us evidence of unity in cause.

II. In each case there is formed a false membrane, having the same microscopical appearance and the same histological structure. In each case there has been poured out upon the mucous surface of some portion of the respiratory tract fibrin and leucocytes to constitute the chief part of the membrane. This entangles some red cells, pus, and epithelium. Wagner holds that the pseudo-membrane contains no fibrin, but that it consists of degenerated epithelial cells laced together by their own processes. Jacobi says this membrane "has been called croupous when it was lying on the mucous membrane, without changing much or at all the subjacent epithelium, and could be removed without difficulty. It has been called diphtheritic when it was embedded into the mucous membrane and was difficult to remove. This difference exists, but it does not justify a difference of names, except for clinical discrimination."

This difference is dependent upon the anatomy of the mucous membrane in the part affected and its glandular supply. The nasal passages, pharynx, epiglottis, and vocal cords are covered with pavement epithelium; the most of the larynx, the trachea, bronchi, and bronchioles, down to those of one-fiftieth of an inch in diameter, are lined with columnar epithelium. The pavement epithelium has no ciliæ; the columnar has; and this fact explains part of the difference in the measure of tenacity with which the pseudo-membrane clings to the mucous membrane. The abundance of muciparous glands in the tonsils and parts of the larynx explain the facility with which the exudate cleaves from these parts. Jacobi says: "Ciliated epithelium is not so liable to be affected. It occupies a higher rank in the scale of animal formations, has a more complex function and a greater power of resistance. The presence of a large number of mucous glands impedes, as a rule, by the presence of the normal secretion, an extensive destructive action upon the tissues. The secreted mucus assists

in removing epithelial masses, and even fibrinous exudations from the surface. Thus it is that the deposit in the respiratory portion of the nasal cavities are frequently cast off through the nostrils, and in a similar manner the membranes that have been formed in the trachea are ejected in a semi-solid form through the opening made in tracheotomy."

III. Both are contagious. Nearly every one admits that diphtheria is contagious, and there is no less authority than Pepper's "System of Medicine" to prove that pseudo-membranous laryngitis is too. But without this authority, his own observations would confirm his faith in this.

Croup is not so contagious as diphtheria, because the pseudo-membrane being on cylindrical epithelium, and on a membrane thickly studded with muciparous glands, is sooner exfoliated, and suppuration does not have an opportunity to go on to the same extent. The products are not, for that reason, so infecting. Another reason why nasal diphtheria is so much more frequently fatal than croup lies in the fact that the lymphatic vessels in the Schneiderian membrane are numerous and large, and communicate directly with the lymph-glands in the neck.

IV. Croup will originate diphtheria, and *vice versa*, as in a case which he relates. Jacobi says: "In the same family, from a case of croup, either another case of laryngeal croup may originate, or another form of diphtheria will develop in other members of the household." He elsewhere says that croup occurs mainly during an epidemic of diphtheria, and that formerly, before diphtheria began to appear in epidemics, it was called, when occurring in the larynx, pseudo-membranous croup. Laws referred a number of cases of croup in adults to pharyngeal diphtheria as their source. Hamilton claims that diphtheria sometimes terminates in croup. Pretty thinks that croup may take its origin in diphtheria, and is then contagious. Ribes asserts that croup, in his practice, rarely occurred without a preceding diphtheria.

V. Both croup and diphtheria will give diphtheritic membranes in surgery. Diphtheritic vaginitis and conjunctivitis and diphtheritic membranes on surgical wounds are too frequent to need more than simple mention. Such membranes in the progress of croup occur less frequently, and for the reasons assigned for its less infectiousness. Diphtheritic membranes on the wound made in tracheotomy for the relief of croup are sufficiently frequent to establish this proposition.

VI. The testimony of writers. Under this head he presents the affirmative testimony of writers, so far as it is available to him, and for the most part obtained from Pepper, Bard, Bretenneau, Jacobi, Mackenzie, Deslanders, Fuchs, Richet,

and Barthez. Trousseau, Bamberger, and Shaffer believe in the identity of the two affections.

Bonning: Pneumonia in Children. (*American Lancet*, April, 1888.)

The writer, quoting from Juergensen, shows that almost one-tenth of all children who died during the first five years of life succumbed to croupous pneumonia, and also, of two hundred cases of croupous pneumonia treated by him (Juergensen) in Kiel and one hundred and thirty treated in Tübingen, about one-half of the cases were children below ten years of age. Children of the poor, those living in bad hygienic surroundings and those who are convalescing from some acute and severe illness, are oftener attacked by pneumonia than those more fortunately situated in life or whose constitution is not run down by previous disease. In children the ushering-in chill is often absent, and headache, nausea, vomiting, delirium, and convulsions may take its place. The temperature rises rapidly, and the respiration and pulse are very much accelerated. Children old enough to speak complain of pain, usually located over the diseased lung. Cough comes on early, and, on account of the pain, children try to suppress it. Children below three years do not, as a rule, expectorate; in older children characteristic pneumonic sputa are found. Cerebral symptoms are very frequent, on account of which the diagnosis during the first twenty-four hours may be difficult. The critical pneumonias differ very little from those in adults. The crisis may set in as early as the fourth day or not before the twelfth. The physical signs differ little from those in adults.

The writer advises alcoholic stimulants for sustaining the heart. Sherry wine has suited him best for this purpose in children. He uses antifebrin, in doses of from one to four grains, about every four hours for reducing temperature. In connection with the use of antifebrin he uses compresses wrung out of ice-cold water, or an ice-bag applied to the affected side, or has the whole thorax wrapped in a cold cloth. In some cases it is necessary to employ the full cold bath. The only precaution necessary, in using the cold bath, is to give just before and after, and, if required, during the bath, some stimulant, preferably strong wine.

Catarrhal pneumonia comes on in the majority of cases in the course of bronchitis, and is, therefore, a secondary affection. It is very liable to complicate or follow diseases in which bronchitis is present. During the beginning of this form of pneumonia the physical signs may be unsatisfactory. There is generally inspiratory retraction of the base of the chest. Per-

cussion does not always give definite results. Auscultation will reveal fine subcrepitant râles over the area of consolidation, besides coarser, dry and moist râles from the preceding bronchitis. Catarrhal pneumonia never ends by crises, and after the acute attack may pass into a subacute or chronic form. The mortality from catarrhal pneumonia is higher than from croupous, and varies from thirty to sixty per cent.; the younger the child the more fatal the issue. The physician who will, especially in young children, never treat a bronchitis lightly will do much towards preventing this dreaded disease. Regulation of the diet and the use of stimulants, when indicated, are necessary. Expectoration should be favored as much as possible. High temperature should be reduced by antifebrin, or, in severe cases, especially in those where respiratory failure is threatening, the cold bath should be resorted to at once, as in croupous pneumonia. If the case progresses into the chronic form pulmonary gymnastics will be of importance. A change of climate, especially sending the patient to some mountain resort, will often bring about beneficial results.

Duhring: Two Cases of Typical Impetigo Simplex.
(*Am. Jour. Med. Sci.*, October, 1888.)

Considerable scepticism obtains in the minds of some eminent dermatologists concerning the existence of a distinct disease of the skin entitled to the name of impetigo. They, for the most part, regard all such manifestations as forms of pustular eczema, as impetigo contagiosa, or as lesions due to parasites or to external irritants.

Both of the patients were boys, four years of age. In both of these cases striking pictures are shown, representing a clearly-defined, distinctive disease, the lesions being peculiar pustules which cannot be confounded with other pustular diseases. They begin as pustules and run their course as such. The process is a simple and benign one; superficial; leaves only a slight pigmentation, which soon passes away; and in both instances cited ran an acute and definite course. The disease is not contagious. It possesses none of the features and characteristics of eczema, the lesions differing in many respects from those of pustular eczema, the "eczema impetiginodes" of older writers. They are discrete, with no disposition to coalesce; are variable in size, for the most part large, the size of a pea, or, occasionally, even a finger-nail. They differ from eczematous pustules, moreover, in possessing thick, firm, resisting walls, with no tendency to rupture or to break down and discharge; finally, in being disseminated and in occupying the general surface with no disposition to localize.

From impetigo contagiosa the lesions differ in being from the beginning much more distinctly pustular, in having firmer and thicker walls, and in presenting larger and more bulky crusts. The history of contagion is also wanting.

There is a difference between these lesions and those of simple ecthyma, which are flatter, and tend to spread more evenly on the circumference; yellower, showing a more active pyogenic nature; and more hemorrhagic, indicating a debilitated state of the tissues, the subsequent crust being brown. In the etiology of the two diseases we find impetigo to occur, as a rule, in healthy individuals, and ecthyma in the broken-down or cachectic.

Owen, Edmund: A Case of Cheiro-Pompholyx. (*Lancet*, June 9, 1888.)

The patient was a child, aged ten years, of healthy appearance. There was no reason to suspect that there was any hereditary taint. While out for a holiday during the summer she became very hot, and drank a large quantity of cold water. When she returned home she complained of great pain in the feet, and upon examination the soles were found studded with a crop of blisters of various sizes, which were thought to be due to pressure from the boots. Since then she has had periodic attacks of blebs upon the hands as well as upon the feet. They last about a week, leaving the parts excessively tender. Soon after she came under observation she developed a rash of lichen urticatus on the flexor aspect of the legs and arms. She was prescribed liquor arsenicalis, and in due course all her troubles disappeared.

Remarks.—Pemphigus of the hands and feet, even in childhood, is a rare disease. What may have been the cause of the first occurrence of the disease is uncertain. The blebs did not appear merely because she was footsore. The fact of the hands becoming implicated is evidence of some general cause, which probably acted through the nervous system.

Field: Cases of Ear-Disease, St. Mary's Hospital. (*British Medical Journal*, June 9, 1888.)

CASE I. *Suppurative meningitis, caused by a bead in the ear.*—The child, aged three, was suffering from purulent discharge from the right middle ear, into which, owing to attempts at removal from the external meatus, a bead had been thrust five weeks previously. It was removed with some difficulty by a hook.

The otorrhœa ceased the following day, when there remained tenderness over the mastoid process, but no œdema or

redness. The temperature ranged from 98.5° to 101°, and the pulse from 140 to 160. Restlessness, intractable vomiting, and constant screaming supervened the next day, and lasted four days, when coma set in.

Two days later, as a localized collection of pus appeared probable, a small opening was trephined in the squamous portion of the temporal bone. There was no pus, but a quantity of cerebro-spinal fluid escaped.

The occipital bone was also trephined, without finding pus. The child died six hours after the latter operation. The autopsy showed flattening of the convolutions, with much puro-lymph in the meshes of the pia over the right temporo-sphenoidal lobe, and about the fissure of Sylvius. A considerable quantity was also found along the base of the brain, even to the medulla. The vessels of the brain were engorged, and the ventricles dilated with serum. No focus of suppuration could be found in the brain. The moral of such histories cannot be too often enforced; for by the adoption of proper modes of treatment, and with the use of proper instruments, nearly all the deaths from foreign bodies in the ear might be avoided.

CASE II. *Consequences of neglected ear-disease.*—The patient, a girl of fourteen, when quite young had suffered from scarlet fever, which left her with a large perforation of the left membrana tympani. Three years before she had been successfully treated for mastoid abscess. Now, on readmission, pus was flowing from the ear, and over the left mastoid there was again a large swelling.

Much pus was evacuated by an opening through the periosteum, but some was found to have burrowed along the sheath of the sterno-mastoid.

Subsequently it was discovered that the sinus communicated with the anterior mediastinum. The patient died three weeks after she came under treatment.

The autopsy showed that she was at once the subject of empyema, pyæmia, pericarditis, pleurisy, and suppuration in the left lateral sinus.

Winters: Croup. (*American Journal of Obstetrics*, September, 1888.)

The writer believes that croup is a special or single disease; that its distinctive and essential character consists in an inflammation of the secreting surface of the fauces, larynx, and trachea, and that the exudative inflammation commences invariably in the superior portion of the respiratory passage, and extends from above downward.

That form of the affection which has been termed spasmodic or catarrhal croup, by some writers, is a variety of this malady and not a distinct disease.

To him, croup is a primary, local, non-contagious disease, the chief exciting cause being the impression upon the body of a cold or damp atmosphere, or sudden transition of temperature.

A new idea has recently been brought to his notice, and that is, that in all cases where a membrane is formed, the inflammation which produced it is arrested, and while it was necessary to treat the inflammation before the formation of the membrane, it is necessary now to treat only the result. Nothing new is offered in the way of treatment.

III.—SURGERY.

Pollard: Treatment of Tubercular Disease of the Knee-Joint by Arthrectomy. (*Lancet*, June 16, 1888.)

The treatment of this affection, especially of the knee-joint, has entered upon a new phase. It is now recognized that it is the complete removal of the tubercular tissues which should be aimed at, and that the removal of bone, except in so far as it is diseased, or interferes with complete extirpation of other diseased tissues, or hinders efficient drainage of the joint, is unnecessary. The author reports nine cases of tubercular disease of the knee. The operation now known as arthrectomy was practised in all these cases. The joints were freely opened and all the diseased tissue removed. Many of the cases healed soundly under a single dressing and without fever, and in all but one case recovery with a sound limb resulted, and with motion. The author believes that this method of treatment is not as widely adopted in all its details as it deserves to be. The minutest antiseptic precautions were taken in each case. The limbs were rendered bloodless by elevation, followed by constriction of the thigh by an elastic bandage. In six of the cases the joints were opened by incisions commencing on each side of the knee at the upper end of the synovial pouch and uniting across the front of the insertion of the ligamentum patellæ. In three the H-shaped incision with transverse section of the patella was employed. The nine cases are carefully reported in detail. In all the disease was progressing so rapidly that some operation was necessary, and, considering the early age of the patients (all between four and seven years), the final results of excision would have been most pitiable.

There are two points which deserve the greatest attention. One is to reduce the loss of blood to a minimum, and the other is to secure absolute rest during the healing process. In these cases, after the diseased tissues were removed the tourniquet was removed long enough to clamp the spurting vessels, and then reapplied to check the oozing. A firm dressing and elevation of the limb to a right angle with the body was then depended upon to check further bleeding. The tourniquet was then removed.

Perfect rest can be obtained by a splint included in the dressing, or plaster of Paris applied outside the dressing. To obtain perfect and prolonged rest an attempt should be made to obtain healing under a single dressing. To achieve this result drainage-tubes should be dispensed with, and provided that the joint be thoroughly aseptic, ample drainage may be secured by leaving a portion of the wound unsutured on each side of the joint. This plan was adopted in five cases with the best results.

The method of opening the joint by division of the patella is thought preferable by the author, as bone unites more firmly than ligament. The wound is, however, more complicated and, in the author's experience, does not heal so well as the curved incision through the ligamentum patellæ.

Gay: *The Comparative Merits of Tracheotomy and Intubation in the Treatment of Croup.* (*Boston Med. and Surg. Jour.*, October 11, 1888.)

The writer gives a large number of statistics showing the percentages of recoveries in tracheotomy and intubation respectively. In tracheotomy the percentage of recoveries varied from twenty-two to thirty-three per cent.; in intubation, from twelve to forty per cent. But, as the author remarks, statistics are proverbially unsatisfactory, and at times they are positively misleading.

His conclusions are that, in a majority of cases of membranous laryngitis, intubation may be done with a fair prospect that it will effectually relieve the dyspnoea for the time being.

That it is to be preferred in young children and in all cases living at a distance from skilled aid, when the tube must be allowed to take care of itself.

That it may be resorted to preliminary to tracheotomy.

That it may be done for euthanasia, provided the operator is reasonably expert and can do it quickly, without producing collapse.

Tracheotomy is indicated in those cases in which intubation

cannot be done, or in which it fails to give relief to the dyspnoea.

In severe cases situated at such distances, or under circumstances in which only ordinary and not skilled assistance can be obtained in an emergency, tracheotomy is the safer method.

It is also to be preferred in those cases of intubation which cannot be fairly nourished either in the natural way or by enemata, etc.

It may be resorted to when the O'Dwyer tube is frequently ejected or when it requires frequent removal to prevent obstruction.

Groner: Can the Sac in Spina Bifida be successfully removed? (*American Lancet*, August, 1888.)

The writer operated on a three-months-old boy for a tumor in the cervical region of the spine. The sac was an inch in diameter at birth, and during the first month had grown rapidly, so that at the time of operating it was three and a half inches in diameter. The opening into the spinal canal would admit an adult's thumb. The operation was done antiseptically; the tissue was dissected away until the pedicle was reached, this was transfixed and tied with catgut, and the sac removed with scissors. There was some escape of fluid; to stop this a harelip pin was passed through and a figure-of-eight catgut suture applied. The integument was drawn over the pedicle, the head of the pin protruding from the wound, and an antiseptic dressing applied. In forty-eight hours the dressing was raised enough to allow the pin to be removed. On removing the dressing, on the seventh day, the wound was found closed, excepting a slight portion in the centre. The child at no time showed signs of fever or discomfort, and the operation was a complete success.

Cleland: Hypertrophic Rhinitis; its Relation to Childhood. (*American Lancet*, February, 1888.)

In a great number of cases in children hypertrophic rhinitis seems to arise idiopathically; especially is this so in the lower classes of children, where the strumous condition prevails, and also in children who inherit the catarrhal or tubercular diathesis. The one great factor in its causation, outside of the constitutional taint, is the frequent attacks of acute rhinitis, contracted by catching cold. Traumatically, it also occurs from the habit which young children frequently have, of introducing foreign bodies into the nostrils, and which sometimes remain for an indefinite time before being recognized.

In chronic rhinitis in children there is always present a

certain amount of hypertrophy. These changes are brought about by infiltration of the mucous layer. This infiltration, stimulated by frequent exacerbations of inflammatory action, becomes organized into new connective tissue. The turbinated bones become permanently enlarged. The enlargement occurs both anteriorly and posteriorly, more frequently posteriorly, on account of the larger size of the venous sinuses in this situation.

In children the one great symptom that attracts attention to the nasal condition is the interference with nasal respiration. The degree of nasal obstruction varies; as the hypertrophy continues the membranes of the nose become more susceptible to the influence of cold and other irritants.

Stimulation of the sympathetic septum has an effect upon it, producing contraction of the blood-vessels, and thus relieving temporarily the nasal obstruction. The effects of nasal obstruction are much more apparent in children than in adults. These little ones persist in breathing through the nose, notwithstanding the nasal obstruction. The constant struggle to force air through the nose, and the necessarily small quantity which reaches the lungs, are causes sufficient to give rise to many of the lung ailments of children. In such cases the pharynx, larynx, and lungs are constantly exposed to the cold, dry air filled with any extraneous matter that may be floating in it.

Among the diseases which are brought about by this variety of nasal stenosis are attacks of asthma, probably due to reflex stimulation. Hyperæmia and also emphysema of the lungs are frequently found. The sense of hearing becomes, in time, affected by the production of changes in atmospheric pressure, and its consequent effects upon the purity of voice and enunciation.

Ribera y Sans: Operative Intervention in Tuberculous Osteo-Arthritis in Children. (*An. de Obst. Ginecop. y Ped.*, August 1, 1888.)

The frequency of this disease in the author's vicinity may be realized from the fact that of twenty-seven girls and twenty-three boys who were in his hospital service, thirteen had tuberculosis of the hip-joint, nine of the knee-joint, and six of the vertebral articulations. The author's paper refers exclusively to operative intervention in the vertebral articulations and in the larger joints, but such cases include the larger portion of all cases of tuberculous joint-disease. In vertebral tuberculosis operations are rarely justified; most cases can be treated with Sayre's corset, either alone or with the jury-mast, if the case is one of Pott's disease of the cervical or upper dorsal

region. If there are abscesses they should be opened, curetted, and disinfected. To attack the osseous lesion alone involves a serious and most delicate operation, which is not infrequently fatal, from unavoidable interference with the spinal cord or its coverings. The author has had two cases of such operations, one of them successful, and quotes the cases of Boeckel, Treves, Dulon, Israel, Polaillon, Delorme, and Buffet, all of which were cured or improved excepting Israel's case and one of Treves's. In tuberculosis of the large joints operative interference often promises excellent results. If the lesion is small and is completely accessible to the sharp spoon, partial or extra-articular operations are suitable; otherwise, one must consider the question of arthrectomy, resection, or amputation. The author's records include 171 cases: affecting the scapulo-humeral joint, 1; the elbow, 15; the hip, 96; the knee, 51; and the tibio-tarsal, 8.

Resections were practised as follows: Scapulo-humeral, 1; elbow, 7; hip, 11; knee, 16; tibio-tarsal, 4.

The scapulo-humeral resection was followed by partial regeneration. Six of the elbow-joint operations were followed by a perfect joint, and one by ankylosis. Of the hip-joint operations, 4 were fatal. Of the knee-joint operations, 2 were supplemented by amputation and 3 were fatal. Of the tibio-tarsal operations, 3 were supplemented by amputation, 2 being fatal. There were also 1 amputation of the elbow-joint and 3 arthrectomies of the knee-joint. The author finds it difficult to lay down precise rules as to the indications for operation, but he believes that in the very large majority of cases of osteo-arthritis a cure can be effected by extra-articular means, hygienic and general treatment, and that operative treatment is indicated when other treatment has failed or when the lesions are so extensive or so advanced that a cure cannot be expected without complete destruction of the tuberculous foci. He is entirely opposed to premature resections, which are uncalled for if as good results can be obtained by other means. Arthrectomy should not be performed if resection or amputation is admissible. In considering the propriety of an operation, it is necessary to know whether the bony or articular lesion exists alone, or whether there are other tuberculous foci which are the cause or the effect of the lesion of the bones. If the tuberculous focus is completely removed, cicatrization and recovery may be rapid and complete. Should an osteo-arthritis exist at the same time with a visceral lesion, the latter may be favorably influenced by resection, especially if the latter brings relief from pain, suppuration, and infection. If, after an operation, there should not be immediate union, and sup-

puration and fever should continue, the visceral lesion might be aggravated. Amputation will consequently be preferable in those cases in which there is a suspicion that resection would be followed by the before-mentioned results, and it must also be done as a last resort if resection has not accomplished the desired results. The result of a successful resection is the establishment of a new joint,—not so perfect anatomically as the original one, but capable of accomplishing all the necessary movements. A suitable joint may not be formed, however, and the limb will simply hang, without the power on the part of the individual to control its movements; but this is better than disarticulation or amputation, especially in the case of the upper extremity. In the lower extremity ankylosis would be preferable to a false joint. The author concludes, therefore, that in tuberculous osteo-arthritis operative intervention is fully justified. As a proceeding of election, if intervention is indicated, one should practise resection with a view of saving the extremity and, in some cases, the functions of the joint. Amputation should be reserved for those cases alone in which resection is contraindicated.

A. F. C.

Chaffey: A Case of Intussusception of the Cæcum and Vermiform Appendix; Death; Necropsy. (*Lancet*, July 7, 1888.)

A child, aged three years, complained of abdominal pain. He had a pinched cast of countenance and had been in this condition about six weeks. He had had vomiting for ten days. The bowels had been regular up to three days previously; since then he had only passed a little blood and mucus.

On examination, an elongated, sausage-shaped tumor was felt in the region of the transverse colon. The abdomen was not preternaturally distended. The next day the child was in a semi-collapsed condition. On examination under chloroform, the tumor was less evident in its previous position, but there was a distinct swelling in the right hypochondrium. During the next ten days the child was kept on a fluid diet and given nutrient enemata. Rectal injections of water combined with gentle manipulation of the abdomen in the region of the tumor caused the tumor to disappear on several occasions. In spite of treatment he grew weaker, and died on the twelfth day after admission.

Necropsy.—No general peritonitis. Great omentum fixed in the vicinity of the cæcum by firm old adhesions. The place of the cæcum was occupied by a rounded tumor composed of the cæcum partly invaginated into itself along with the ileo-cæcal valve, the parts being held in this relationship

by old adhesions stretching across the fissure between the small intestine and the caput coli. The adventitious bands were sufficiently long to allow of the change in the position to be observable apparently during life. The vermiform appendix was found inverted into the cavity of the cæcum close to the ileo-cæcal valve. The cæcum was more roomy than natural and its walls much hypertrophied.

The special points of interest were:

1. The unusual condition of the parts. The old adventitious bands originated probably in some inflammatory mischief. Their subsequent contraction would account for the inversion of the vermiform appendix and adjacent portion of the cæcum.
2. Abdominal section probably would not have afforded any material relief. The obstruction to the passage of fæces was by no means complete at any time.
3. External manipulation very materially aided the action of the injections per rectum.

Zaleski: The Unsuitability of Silver Tubes for Tracheotomy. (*Lancet*, April 28, 1888.)

The author has seen a silver tube, left in for about two years without being withdrawn or cleansed, reduced to the appearance of a coarse cobweb by the solvent action of the contents of the air-passages. He explains the chemical process by the action of the chloride—present in almost all the secretions of the body—upon metallic silver. Chloride of silver is again dissolved by the action of the alkaline secretion. This dissolved silver is partly expectorated, and probably partly absorbed.

Argyria is therefore possible in those wearing tracheotomy tubes of silver or silver pessaries, etc. We must realize that the use of such a comparatively easily-soluble metal as silver for the construction of tracheotomy tubes is fraught with danger to life from the possibility of causing a serious and incurable disease.

The possibility, also, of setting up a catarrhal condition of the mucous membrane of the air-passages, from the irritant action of the dissolved silver, must not be lost sight of. When only threads and films of metal remain the patient's life is rendered precarious, as there is always danger of his being choked or injured by fragments broken off.

The material of which the tube should be constructed may be gold, platinum, rock crystal, porcelain, glass, or even ivory. These substances are all only very slightly soluble in the fluids of the body; none of them in any appreciable quantity.

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Original Communications.

THERAPEUTICS OF INFANCY AND CHILDHOOD.

BY A. JACOBI, M.D.,

Late President of the New York Academy of Medicine, Clinical Professor of the Diseases of Children in the College of Physicians and Surgeons, New York, etc.

(Continued from February Number.)

V.—INFECTIOUS DISEASES.

12. *Diphtheria*.*

THE treatment must be mainly preventive. Every case of diphtheria must be isolated, during the winter on the upper floor of the house, windows open as much as possible, furniture of any kind reduced to the least possible quantity, the room changed every few days, the bedding frequently.

To what extent the infecting substance may cling to surroundings is best shown by the cases of diphtheria springing up in premises which had not seen diphtheria for a long time,

* The therapeutics of diphtheria has been the subject of a paper read by the author, by invitation, before the Philadelphia County Medical Society, on May 23, 1888, and part of the discussion in the Children's Section of the British Medical Association, last August. Though the former essay has been copied in a number of journals of the country, this series would not be complete without due reference to the treatment of a disease which has established itself as a permanent scourge among us, and constantly baffles the best-directed efforts of the most thoughtful and skilful practitioner.

but had not been interfered with ; and best, perhaps, by a series of observations of auto-infection. When a diphtheritic case has been in a room for some time, the room, bedding, curtains, and carpets are infected. The child is getting better, has a new attack, may again improve, and is again stricken down. Thus I have seen them die ; but also improve immediately after being removed from that room or house. If barely possible, a child with diphtheria ought to change its room and bed every few days.

The sick in crowded houses and quarters ought to be transferred to a special hospital, which ought not to be too large. The Willard Parker Hospital, foot of East Sixteenth Street, New York, with its sixty beds for scarlatina and diphtheria, is in that respect a praiseworthy example. The large amount of good it is doing would grow in geometrical progression if there were, as there ought to be in a large and ambitious metropolis, half a dozen institutions of the same class. When diphtheria breaks out in a house, either private or tenement, the well must be removed to a healthy place ; in large cities, temporary homes ought to be provided for that purpose, to benefit the children of the poor. If the rich would but remember that their children will be affected through the many links between them and the poor (servants, messengers, schools, dresses brought home from the tailor or seamstress, or purchased in the stylish and expensive establishments which give out the work to tenement working-people), their very egotism would compel them to do in the public interest what humanity does not urge them to perform. The sick must be reported to the health boards. The well children of a family with diphtheria must not go to school or church before a fortnight—the possible period of incubation—has elapsed since their last contact with the sick. Schools must even be closed now and then, when an epidemic makes its appearance ; teachers instructed in the examination of throats. The condition of the house is to be examined into and improved ; attendants, servants, nurses and cooks, seamstresses and laundresses, teachers, shopkeepers, restaurateurs, barbers, hair-dressers, with their mild diphtheritic attacks and strong pecuniary interests, are frequent sources of infection. In times of common danger, public places, thea-

tres, ball-rooms, dining-halls, public vehicles, hackney-coaches, and railroad-cars must be superintended by the authorities. There must be no clashing permitted between the public good and the individual money-bag. Clothing, bedding, room, and house must be thoroughly disinfected; articles used in the sick-room burned or soaked in a disinfecting fluid in the room, not carried over the house in a dry state; the rooms thoroughly disinfected after a case terminated favorably or unfavorably; the corpse disinfected, the funeral private, nothing removed from the house unless disinfected, no pieces of carpet thrown away to be picked up by beggars, no mattresses benevolently donated to the unsuspecting poor.*

* To what extent contagion will prove dangerous, a case which was reported to me lately shows as well as anything I ever experienced. Unfortunately, I have not yet received the permission of my correspondent to mention names, but the facts speak loud enough. The communication I refer to came from —, Kansas, a few months ago, and is as follows: " . . . The water used by the family is of the best quality, the drainage perfect, and the hygienic surroundings perfect, as far as I can make out. There has never been an undoubted case of diphtheria in the town, nor are there cases near here. The little fellow has not been away from home, nor have outsiders been at his home.

"The case was at first tonsillitis, the result of exposure to cold. An abscess formed in one tonsil, and, after its rupture and discharge, the child had temporary relief. Up to this time there had been no particular systemic disturbance other than the tonsillar trouble would account for, nor were the voice and breathing affected any different from what would be expected in this disease. A day or so before the abscess broke, his mother thought swabbing the throat with alum-water might give him relief, and she proceeded to do this, using a sponge-swab that she had used in swabbing the throat in a case of diphtheria in her family in Chicago two years ago. Two days after using this swab laryngeal stenosis began to show itself, together with a profound systemic disturbance characteristic of diphtheria, and death resulted in three or four days from septic absorption and obstruction to breathing. Before I saw him his mother had applied some liniment over the angle of jaw, which produced a blister. No change was observed on this blistered surface until about the time the laryngeal stenosis began to show itself, when a tough, grayish membrane, closely adherent to the underlying surface and bleeding when detached—which was done with difficulty—showed itself. The urine showed by ordinary test about one-fourth albumin. I cannot account for the trouble in any other way than through the swab used.

"The family moved from Chicago to Detroit, where they lived six months before coming here last February, carrying the swab with them

The rules for disinfection, published by the National Board of Health in its Bulletin No. 10, of September 6, 1879, are still classical, very much more so than the suppression of that beneficent board—which might have proved a lasting blessing to the whole commonwealth—in this our surplus-ridden country, from motives of ill-advised parsimony. I have copied them in my “Treatise on Diphtheria,” Wm. Wood & Co., New York, 1880, and in the first volume, p. 698, of the “American System of Medicine.” They may not be accessible to some of my readers, and will be welcome to all.

“Instructions for Disinfection.”

“Disinfection is the destruction of the poisons of infectious and contagious diseases.

“Deodorizers, or substances which destroy smells, are not necessarily disinfectants, and disinfectants do not necessarily have an odor.

“Disinfection cannot compensate for want of cleanliness nor of ventilation.

“I. Disinfectants to be employed.

“1. Roll-sulphur (brimstone) for fumigation.

“2. Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds to the gallon; for soil, sewers, etc.

“3. Sulphate of zinc and common salt, dissolved together in water in the proportion of four ounces sulphate and two ounces salt to the gallon; for clothing, bed-linen, etc.*

“II. How to use disinfectants.

on their travels. There can be no doubt but that the case in Chicago on which the swab was used was one of diphtheria. Diphtheria was epidemic in the part of the city in which they lived, and the diagnosis was made by an able physician. About one-third of those attacked in this epidemic died.” . . .

* Carbolic acid is not included in the above list for the following reasons: It is very difficult to determine the quality of the commercial article, and the purchaser can never be certain of securing it of proper strength; it is expensive when of good quality, and experience has shown that it must be employed in comparatively large quantities to be of any use; it is liable by its strong odor to give a false sense of security.

"1. *In the sick-room.*—The most available agents are fresh air and cleanliness. The clothing, towels, bed-linen, etc., should, on removal from the patient, and before they are taken from the room, be placed in a pail or tub of the zinc solution, boiling hot, if possible.

"All discharges should either be received in vessels containing copperas solution, or, when this is impracticable, should be immediately covered with copperas solution. All vessels used about the patient should be cleansed with the same solution.

"Unnecessary furniture,—especially that which is stuffed,—carpets, and hangings, should, when possible, be removed from the room at the outset, otherwise they should remain for subsequent fumigation and treatment.

"2. Fumigation with sulphur is the only practical method for disinfecting the house. For this purpose the rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with zinc solution, should be opened and exposed during fumigation, as directed below. Close the rooms as tightly as possible, place the sulphur in iron pans, supported upon bricks placed in wash-tubs containing a little water, set it on fire by hot coals or with the aid of a spoonful of alcohol, and allow the room to remain closed for twenty-four hours. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionately increased quantities.

"3. *Premises.*—Cellars, yards, stables, gutters, privies, cess-pools, water-closets, drains, sewers, etc., should be frequently and liberally treated with copperas solution. The copperas solution is easily prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

"4. *Body- and bed-clothing, etc.*—It is best to burn all articles which have been in contact with persons sick with contagious or infectious diseases. Articles too valuable to be destroyed should be treated as follows:

"a. Cotton, linen, flannel, blankets, etc., should be treated with the boiling-hot zinc solution, introduce piece by piece, secure thorough wetting, and boil for at least half an hour.

"b. Heavy woollen clothing, silks, furs, stuffed bed-covers,

beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, their surfaces thoroughly exposed, and pockets turned inside out. Afterwards they should be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., should be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but should afterwards be removed to the open air and thoroughly beaten.

"5. Corpses should be thoroughly washed with a zinc solution of double strength; should then be wrapped in a sheet wet with the zinc solution, and buried at once. Metallic, metal-lined, or air-tight coffins should be used when possible, certainly when the body is to be transported for any considerable distance."

Prevention can accomplish a great deal for the individual. Diphtheria will, as a rule, not attack a healthy integument, be this cutis or mucous membrane. The best preventive is, therefore, to keep the mucous membrane in a healthy condition. Catarrh of the mouth, pharynx, and nose must be treated in time. Many a chronic nasal catarrh, with big glands round the neck, requires sometimes but two or three regular salt-water injections (1 to 130) into the nose, and gargling, if the children be large enough to do so. The addition of one per cent. of alum will often be found useful. This treatment, however, must be continued for many months, and may require years. Still, there is no hardship in it, and no excuse for its omission. The nasal spray of a solution of nitrate of silver, 1 to 500 or 1000, will accelerate the cure. Its application must be repeated every other day. Not infrequently has a treatment which was considered obsolete when I was young been of great service to me. It consists in the internal administration of the tincture of *pimpinella saxifraga*. It is certainly an efficient remedy in subacute and chronic pharyngitis and laryngitis. I generally give it to adults, diluted with equal parts of glycerin and water, a teaspoonful of the mixture every two or three hours, with the proviso that no water must be taken soon after; children in proportion.

Large tonsils must be resected in times when there is no

diphtheria. For during an epidemic every wound in the mouth is liable to become diphtheritic within a day, and such operations ought to be postponed if feasible. The scooping of the tonsils, for whatever cause, I have given up since I became better acquainted with the use, under cocaine, of the galvano-cautery. From one to four applications to each side, or to the post-nasal space, are usually sufficient for every case of enlarged tonsils or lacunar amygdalitis ("tonsillitis"). It is advisable to cauterize but one side at a time, to avoid inconvenience in swallowing afterwards, and to burn from the surface inward. Cauterization of the centre of the tonsils may result in swelling, pain, and suppuration, unless the cautery is carried entirely to the surface; that means to say, the scurf must be on, or extend to, the surface. Another precaution is to apply the burner cold, press it on, and then heat.

Nasal catarrh and proliferation of the mucous and sub-mucous tissue may require the same treatment, but in my experience the cases which demand it are less frequent than those in which the tonsils need correction.

The presence of glandular swellings round the neck must not be tolerated. They, and the oral and mucous membranes, affect each other mutually. Most of them could be avoided, if every eczema of the head and face, every stomatitis and rhinitis resulting from uncleanness, combustion, injury, or whatever cause, were relieved at once. A careful supervision of that kind would prevent many a case of diphtheria, glandular suppuration, deformity, or phthisis.

For its salutary effect on the mucous membrane of the mouth, chlorate of potassium, or sodium, which is still claimed by some to be a specific in diphtheria, or almost so, is counted by me among the preventive remedies. If it be anything more, it is in a case of diphtheria an adjuvant. It exhibits its best effects in the catarrhal and ulcerous condition of the oral cavity. In diphtheria it keeps the mucous membrane in a healthy condition, or restores it to health. Thus it prevents the diphtheritic process from spreading.

Diphtheria is seldom observed on healthy, or apparently healthy, tissue. The pseudo-membrane is mostly surrounded

by a sore, hyperæmic, œdematous, mucous membrane, to which it will then extend. Indeed, this hyperæmia precedes the appearance of the diphtheritic exudation in almost every case. The exceptions to this rule consist of those cases in which the virus may take root in the interstices between the normal tonsillar epithelia, pointed out by Stoehr but a few years ago. Indeed, many cases of throat disease occurring during the prevalence of an epidemic of diphtheria are but those of pharyngitis, which, under favorable circumstances, may develop into diphtheria. These throat diseases are so very frequent during the reign of an epidemic, that in my first paper on diphtheria (*Amer. Med. Times*, August 11 and 18, 1860) I based my reasoning on two hundred cases of genuine diphtheria, and one hundred and eighty-five of pharyngitis without a visible membrane.

These cases of pharyngitis, and such of stomatitis and pharyngitis accompanying the presence of membranes, are benefited by the local and general effect of chlorate of potassium. The surrounding parts being healthy or returning to health, the membrane remains circumscribed. The generally benign character of purely tonsillar diphtheria, which is apt to run its full course in from four to six days, has in this manner contributed to secure to chlorate of potassium the undeserved reputation of being a remedy, *the* remedy, in diphtheria. The dose of the salt must not be larger than fifteen grains (one gramme) for an infant a year old, not over twenty or thirty (1.5 to 2) for a child from three to five years, in the twenty-four hours. An adult must not take more than one and a half drachms (six grammes) daily. These amounts must not be given in a few large doses, but in repeated doses and at short intervals. A solution of one part in sixty will allow a teaspoonful every hour, or half a teaspoonful every half hour in the case of a baby one or two years old.

It is not too late yet to raise a warning voice against the use of larger doses. Simple truths in practical medicine do more than simply bear repetition: they require it. For though the cases of actual chlorate of potassium-poisoning are no longer isolated, and ought to be generally known, fatal accidents will still occur even in the practice of physi-

cians. When I experimented on myself, with half-ounce doses, thirty years ago, the results were some gastric and intense renal irritation. The same were experienced by Fountain, of Davenport, Iowa, whose death from an ounce of the salt has been impressively described in Alfred Stillé's "*Materia Medica*," from which I have quoted it in my treatise on diphtheria. His death from chlorate of potassium induced me to prohibit large doses as early as 1860. In my contribution to Gerhardt's *Handbuch der Kinderkrankheiten*, vol. ii., 1877, I spoke of a series of cases known to me personally. In a paper read before the Medical Society of the State of New York in 1879 (*Med. Record*, March 15), I treated of the subject monographically, and alluded to the dangers attending the promiscuous use of the drug, which has descended into the ranks of domestic remedies; and, finally, in my treatise (New York, 1880), I collected all my cases and the few then recorded by others. Since that time the recorded cases have become quite numerous, and less than a year ago a few new ones were related before the Practitioners' Society of New York. The facts are undoubted, though the explanations may differ. The probability is that death occurs from methæmoglobinuria produced by the presence of the poison in the blood, though Stockvis, of Amsterdam, has tried, by a long series of experiments, to fortify my original assumption that the fatal issue was due to acute nephritis.

There is, in every individual case, a certain danger, which, though it be common enough in other exhausting diseases, is of particular moment in diphtheria, where it is most frequent. It can be averted by meeting it early. It is heart-failure. Where it has occurred, the indications for treatment become so clear as they are urgent and often futile. When it is simply feared, a preventive treatment will save many a case.

Heart-failure is usually developed gradually. It is foreshadowed by an increasing frequency and weakness of both heart-beats and pulse, by an occasional intermission, by unequal frequency of the beats in a given period (say of ten seconds), or by the equalization of the interval between systole and diastole, and diastole and systole. This latter condition,

which is normal in the embryo and foetus, is always an ominous symptom.

Heart-failure is due, besides the influences common to every disease and every fever, to tissue changes in the myocardium, in the nerves, or both. These changes may be due to the ill-nutrition of the tissues resulting from every septic condition of the blood, or specific alterations due to the diphtheritic process. Failure may either come on after having given warning, or it may be on you without any. Thus, there is no case of diphtheria—beyond, perhaps, those of the mild tonsillar form—but ought to make us anxious and afraid. Indeed, there is no safety and no positive prognosis until the patient is quite recovered, and even advanced beyond the period in which paralysis may develop.

Whatever enfeebles must be avoided; absolute rest must be enjoined. The patients must be in bed, without excitement of any kind; take their medicines—which ought to be as palatable as possible—and their liquid food, and evacuate their bowels, in a recumbent or semi-recumbent position; crying and worrying must be prevented; the room kept airy and rather dark, so as to encourage sleep if the patient be restless; and restless they are, unless they be under the influence of sepsis, and thereby subject to fatal drowsiness and sopor. In no disease, except, perhaps, in pneumonia, have I seen more fatal results from exertion on the part of the sick, or from anything more than a sudden change of posture. Unless absolute rest be enforced, neither physician nor nurse have done their duty. The latter must avoid all the dangers attending the administration of medicines, injections, sprays, and washes. Preparations for the same must be made out of sight, every application made quickly and gently. On no account must a patient be taken out of bed for that purpose. I know of children dying between the knees of nurses who called themselves trained and had a diploma.

Pharmaceutical preparations, such as digitalis, strophanthus, sparteine, caffeine, besides camphor, alcohol, and musk, must not be postponed until feebleness and collapse have set in. These are at least possible, even probable; and this is certain, that a cardiac stimulant will do no harm. It is advisable to use it

at an early date, particularly in those cases in which antipyrin or antifebrin are given. Besides, it is not enough that the patients should merely escape death; they ought to get up, *cito, tuto, et jucunde*, with little loss and speedy recuperation; a few grains of digitalis or their equivalent—preferably a good fluid extract—may or must be given in a pleasant and digestible form daily. When a speedy effect is required, one or two doses of two or four minims each are not too large, and must be followed up by smaller ones. When it is justly feared lest the effect of digitalis be too slow, I give, with or without it, sulphate of sparteine. An infant a year old will take one-tenth of a grain four times a day as a matter of precaution, and every hour or two hours in an emergency.

Of the same importance are alcoholic stimulants. The advice to wait for positive symptoms of heart-failure and collapse before employing the life-saving apparatus is bad. There are cases which get well without treatment, but we do not know beforehand which they will be. No alleged mild case is safe until it has recovered. When heart-failure has once set in—and often will it occur in apparently mild cases—our efforts are too often in vain. Thus alcoholic stimulants ought to be given early and often, and in large quantities, thoroughly diluted. There is no such thing as danger from them or intoxication in septic diseases. A few ounces daily may suffice; but I have often seen ten ounces daily of brandy or whiskey save children who had been doing badly with three or four.

Caffeine, or, in its stead, coffee, is an excellent cardiac tonic, except in those cases in which the brain is suffering from an active congestion. For subcutaneous injections the salicylate (or benzoate) of caffeine and sodium, which readily dissolves in two parts of water, is invaluable for emergencies, in occasional doses of from one to five grains in from two to ten minims of water. From five to twenty grains of camphor may be given daily, as camphor-water, or in a mucilaginous emulsion, which is easily taken. It does not so disturb the stomach as carbonate of ammonium is apt to do. For rapid effect it may be administered hypodermically, in five parts of almond oil, which is milder and more conven-

ient than ether. Strychnine may be added regularly from the beginning of failure, but mainly in cases with little increase of temperature. Its effect is more than momentarily stimulating. A child of three years will take a one-hundredth of a grain three times a day, and more in an urgent case. But the very best internal stimulant in very urgent cases is Siberian musk. I prefer to give it from a bottle, in which it is simply shaken up with a thin mucilage. In urgent cases it ought to be given in sufficient doses and at short intervals. When ten or fifteen grains administered to a child one or two years old within three or four hours will not restore the heart's action to a more satisfactory standard, the prognosis is very bad.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from February Number.)

IV.—STOMATITIS ULCEROSA.

Synonymes.—French, Stomatite Ulcero-membraneuse; German, Stomacace, Mundfäule.

WE have to deal here with a disease with a very limited literature, with a most distinctive clinical picture, and one whose causation is as yet unknown, except as a matter of theory. To this might be added a disease whose treatment is thoroughly well understood.

The historical development is that of comparatively recent times. We find the French authors first describing the affection either as a gangrenous process (Taupin, 1839), diphtheria of the mouth (Bretonneau, Trousseau), and, finally, as an ulcerative-membranous process (Barthez and Rilliet, and those

following). In England, West was one of the first to publish an excellent description of the disease, and then to give us the remedy, which is almost a specific. In Germany, writers like Jörg, Wendt, Schnitzer, and Wolf (1826-1844) give descriptions of stomacace, which, however, are not always perfectly clear as far as our present knowledge goes, so that the credit of the first sharply-cut description belongs to Bohn (1866). From this time little, if anything, has been added to our knowledge upon the subject; all the hand-books contain more or less lengthy chapters upon this disease, with descriptions more or less accurate. The position of the disease in nosology, then, is well recognized, and all modern writers, notwithstanding omissions in description, seem to have seen the same thing when they write about ulcerative stomatitis. The various views that have been held concerning the nature of the disease can be omitted as subject of historical importance, but as valueless at the present day.

Stomatitis ulcerosa is a disease characterized by a peculiar pathological process, which terminates in molecular destruction of tissue. It begins on the gums around the teeth, it never extends beyond the cavity of the mouth, and it has the power of inoculating other parts of the mucous membrane. It may be well to emphasize the fact that stomatitis ulcerosa does not occur where there are no teeth.

Etiology.—Much has been written concerning the cause or causes of this disease, but as yet we only have clinical evidence, which shows that in the majority of cases there are two factors at work,—the one general, the other local. It has been conceded by all authors that there are certain poisons which will produce a clinical picture identical with that of stomatitis ulcerosa. First and foremost comes mercury, then lead, phosphorus, and copper, to which might be added iodine. In these days, when we have almost returned to the mercury-therapy of our forefathers, it is well to remember that mercury will produce stomatitis, and much more rapidly in children than in adults. Indeed, fifteen or twenty years ago mercury was used with the greatest care in children, because of the knowledge of this fact, which seems to have been forgotten in our enthusiasm for antiseptic remedies, and not a little of the success of some

physicians with medical idiosyncrasies was due to their not using mercury.

If we admit the mercurial stomatitis as typical of and identical with the stomatitis ulcerosa, it is possible to arrive at some conclusion regarding the nature of the affection. Mercury is partially excreted by the saliva, and accompanying this process there is more or less inflammation of the mouth. It is a notorious fact that where there already exists an irritation of the mucous membrane, in the form of a carious tooth, or the hyperæmia of alcoholics or of smokers, there the inflammation will take place with most intensity, and is frequently followed by the production of ulcers. If we examine into the process as it is going on here, we are forced to the conclusion that we are dealing with a process purely local in its nature. This is quite true, for in many instances a mercurial stomatitis is produced long before systemic reaction has taken place, on account of prolonged administration of mercury. Yet the local effect upon the mouth comes from the general system, and the mercury is to be looked upon as predisposing cause as much as the immediate cause. In other words, to produce a stomatitis ulcerosa, it is necessary that the mucous membrane be prepared in some way, so that the process itself can be continued. Before we have stated that the mercury acts both as predisposing and immediate cause. The latter cannot be verified, except in that mercury will, in most instances, produce stomatitis ulcerosa when pushed far enough.

Naturally, the question of the rôle that is played by lower organisms would come up here as well as in every inflammation. In the investigations that I have made, the result was positive only in so far that the various pus-producers were found, which could have been expected. The assumption that the mercury causes the mucous membrane to be changed in such a way as to become a good soil for the development of these pus-producers could not be maintained. For it is not an ordinary pus-producing process that we are dealing with, as will be seen from the pathological anatomy, but one that is almost unique in its way. That there is some specific cause at work must be taken for granted, on account of the peculiar nature of the process,

and that this cause is in the nature of a lower form of life, or some infectious agent is proven by therapeutic measures. We know that stomatitis mercurialis can be almost indefinitely prevented by absolute cleanliness. We know, furthermore, that certain agents, having for their physiological effect the giving off of oxygen, will relieve and cure stomatitis ulcerosa most rapidly. We are, then, forced to the conclusion that in stomatitis mercurialis, or ulcerosa, there is, first, a general cause (better systemic) and a local cause. The local cause in stomatitis mercurialis cannot be definitely ascertained, but reduces itself either to mechanical irritation produced by excreted mercury (lead, phosphorus, iodine, etc.) or some infectious agent.

If we now apply this knowledge to stomatitis ulcerosa in subjects not under the physiological manifestations of these remedies, it will be seen that clinical facts will give us data more or less satisfactory. As to general causes, Barthez and Rilliet say, "Il n'est pas une des maladies de l'enfance dans le cours desquelles elle ne puisse survenir" ("There is not a single disease of infancy during the course of which it could not develop." Barthez and Rilliet, vol. i. p. 201). With us there are certain diseases which are accompanied by this form of trouble more frequently than others,—the eruptive diseases, especially measles and scarlatina, malarial troubles, typhoid fever, pneumonia, and whooping-cough. Children affected with rachitis, syphilis, or tuberculosis are apt to have this trouble. Again, on the other hand, there are those children who seem to be comparatively healthy, in whom the least disturbance will bring on an attack of stomatitis ulcerosa. Cases will come under observation in which there will be repeated attacks of this disease, provoked by a bronchitis, a slight gastric disturbance, an attack of coryza. I have under my charge a child, now five years of age, who, since the appearance of his teeth, has had stomatitis ulcerosa follow almost every illness he has had, whether slight or severe. Except for a slight enlargement of the glands in the neck this child seems to be perfectly healthy.

Nearly all writers have laid stress upon the external surroundings of the patient as cause. Barthez and Rilliet (*loc.*

cit.) state that the disease is endemic in some wards of some hospitals. Nearly all authors (Taupin, Bohn, Henoch) claim an effect from damp, poorly-ventilated houses. Unsalubrious climate is also accused of causing this disease,—*i.e.*, rapid changes from warm to cold, from dry to moist, etc. The diet of a child must also be looked upon as causative. A poorly, badly-nourished child will be more apt to have the affection than one correctly fed, so that poor children are more liable to the disease than the children of well-to-do parents. Scorbutus has also been put down as one of the general diseases producing stomatitis ulcerosa. This disease is so very rare in children in this country that practically the relation is unimportant.

For local causes in the mouth we must look to the teeth principally. Bohn says, "Without teeth no ulcerative stomatitis." The explanation for this fact is to be found, probably, in that the gums form a favorable place for the poison to develop. That disease of adults known as dental pyorrhœa—shrinking of the gums—is frequently produced by the accumulation of tartar at the bottom of the teeth. Sometimes this form of trouble is nothing more or less than a true stomatitis ulcerosa, even in the adult. Now, while it is extremely rare for children to have tartar upon their teeth,—*i.e.*, during the period of first, or the beginning of second, dentition,—the production of this deposit shows how easily substances may accumulate upon the teeth around the gums. When we take into consideration that adults sometimes, even with the greatest care and cleanliness, cannot prevent this deposit of tartar, it seems very rational to believe that children whose mouths are apt to be imperfectly cleaned, if at all, may have substances deposited upon their teeth. Now, given a child which has its gums prepared by some general trouble for the reception and growth of the poison or irritant of stomatitis ulcerosa, and the origin of the trouble is readily understood. Where the irritation is abnormally great, as from bad teeth, the result of syphilis, rachitis, or carious teeth, it is quite clear that stomatitis ulcerosa will be more apt to be developed, and when developed more intense, than in a child with healthy teeth.

That stomatitis occurs endemically in certain wards of a hospital, in certain barracks, or among a certain class of soldiers,

has been known since Berjeron, Taupin, and Barthez and Rilliet. By some authors the term epidemic was used instead of endemic, and the discussion naturally arose concerning the contagiousness of the affection. The older writers thought the affection was contagious, while most of the modern writers (Bohn, Henoch, Gerhardt, and others) reject this idea. Hirsch (*Handbuch d. Histor. Geograph. Path.*) comes to an opposite conclusion, which, it will be seen, is probably the correct one. The argument used by all who oppose the contagious nature of the affection is that all attempts at inoculation of children have given negative results. In the present state of our knowledge of infectious diseases it will be granted that a conclusion based upon facts such as have been enumerated is inadequate. The experiment made was to take some of the secretion or pus from a surface affected with stomatitis ulcerosa and inoculate the gums of another child with it. The result being negative, the disease is not contagious. We are now fully convinced of the fact that it takes more than the presence of a virus to produce a given disease. In this connection it is necessary only to refer to the experimental attempts made to inoculate typhoid-fever germs or cholera, which have so often been attended by failure, and which, when done in the correct way, are followed by success. So it is with stomatitis ulcerosa. Given a patient whose gums are in a proper condition, and inoculate these gums with pus from a stomatitis ulcerosa, and the result will be stomatitis ulcerosa. The trouble in making this experiment is that we are not in a position to state positively that in a given case the gums are in such a condition as to be affected by the virus. If we take healthy children and try to inoculate their gums with this poison, the result will always be negative. In some researches which I made five years ago this was proven to my complete satisfaction. In making these experiments upon healthy subjects, I never succeeded in producing anything more than a slight inflammation, which got well very readily. It must be confessed, furthermore, that positive results which were obtained upon sick children were the exception and not the rule. But this was due to the difficulty of choosing proper subjects. The patients that I took, in whom I expected to get results, were affected

either with rickets, so-called scrofula, or had very bad teeth with swollen gums. In all the cases in which I tried but three were successful. In these three cases there was present in one tuberculosis, and in the other two nothing more than carious teeth, with a very bad condition of the gums. The great objection which could be raised to this series of experiments is, that the patients with whom I succeeded were under the same hygienic influences as those that had the disease. In the first case, one other member of the family had the affection, and the other two belonged to the same family, and were inoculated from material taken from a third member of the same family. It may be urged that all of these three patients might have had the disease even if they had not been inoculated. However, the stomatitis followed so quickly after inoculation began at the spot where the pus was introduced and the patients had been exposed to the bad hygienic conditions for so long a time that the observer could not but be impressed by the fact that the disease followed the introduction of the poison into the diseased gums. I am far from accepting these results as conclusive, as I wish to extend the observation, hoping to succeed by inoculating pure cultures of the bacteria found in stomatitis ulcerosa upon proper soil. But of this much I am convinced, that it takes more than bad hygienic conditions, poor air, etc., to produce a stomatitis ulcerosa. Again, for prophylactic purposes, it is of the highest importance to remember that the possibility exists of having the disease transmitted from one member of the family to another. It is not an uncommon observation to have more than one member of the same family affected by this disease. I have seen all the children in a single family—seven in one instance,—in various stages of stomatitis ulcerosa. When we see how, for instance, for the causation of alopecia areata, Lassar (*Therapeut. Monatshefte*, ii., 1888) shows that the use of the same hair-brush, or going to the same barber, can be accepted as evidence of the infectious nature of that affection, we are certainly justified in using the frequent occurrence of stomatitis ulcerosa in different members of the same family as an argument in favor of its being infectious. For stomatitis ulcerosa we have even more direct contact than is proven for alopecia areata,—kissing, using the same table utensils, etc.

That the soldiers alone and not the officers become affected with this disease, when it becomes epidemic in garrisons, has been used as an argument against the non-infectious nature of stomatitis ulcerosa. It is claimed that the soldiers are under worse hygienic effects than the officers. That they come into more intimate contact with each other; that they wash out of the same basin, use the same drinking-cups, sleep together in large rooms, etc., is lost sight of altogether by those who insist upon the disease not being infectious. The officers, on the other hand, do not live together as do the soldiers, and, therefore, cannot infect each other as the soldiers do. Again, the rarity of the disease among seamen has been alluded to by Berjeron, and has been ascribed to the fact that the air upon the ocean is better than upon the land, therefore soldiers have the disease more frequently than sailors. The explanation for the comparative rarity among seamen is not the one offered, but the fact that all governments have been careful to regulate and train their sailors in such a way that they may escape that much-dreaded disease of the sea, scurvy. In doing this, especial attention is called to the condition of the mouth, and when any disease occurs there it is immediately looked to. Furthermore, all those means employed to combat scurvy—good nutrition, good air, cleanliness of the mouth—are excellent means to prevent the development of favorable soil for stomatitis ulcerosa. Unfortunately, for a conclusive decision of this matter, experiments are still wanting as to the exact nature of the poison and the nature of the soil.

The disease occurs principally between the ages of five to ten years; it is rare after this time, but much rarer before the age of four to five years.

(To be continued.)

ACUTE LOBAR PNEUMONIA IN CHILDREN.*

BY CHARLES W. TOWNSEND, M.D.,

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PAPERS and statistics on pneumonia in children commonly include both lobar, otherwise known as croupous or fibrinous pneumonia, and broncho-pneumonia, also called lobular or catarrhal pneumonia, two diseases entirely distinct in their etiology, course, and prognosis, but both having the seat of their lesions in the lungs.

Lobar pneumonia, it seems to me, is best considered as an acute specific disease, while broncho-pneumonia is always secondary to bronchitis, and is due to an extension of the inflammatory process. Death certificates are generally signed pneumonia, without further specification, a fact which very much diminishes the value of statistics made from their returns. Thus, in 1887, the Board of Health of Boston reports 795 deaths from pneumonia, 25 from broncho-pneumonia, and 7 from pleuro-pneumonia; but it is, of course, evident that many cases of broncho-pneumonia are included among the 795 cases of *pneumonia*. The value of these records would be much increased if physicians would exercise more care, and a list of names of diseases, published from time to time by boards of health to conform to scientific nomenclature, and distributed among physicians, would aid in securing more exactness and uniformity.

It is generally considered, and it is taught in many of the text-books, that in young children the form of pneumonia is usually lobular, and that true lobar pneumonia occurs only in older children and adults. Thus Vogel† says: "Lobar pneumonia, with the exception of the metastato-pyæmic form,

* Read before the Suffolk District (Massachusetts) Medical Society, October 27, 1888.

† Diseases of Children, 1885.

occurring in lying-in and foundling hospitals, is remarkably rare in the nursling." And J. Lewis Smith* says: "In children over the age of three years pneumonitis differs but little in form or phenomena from that of the adult. . . . In those under the age of three years it is, on the other hand, as a rule, a secondary affection, and limited to a part of a lobe." From both of these latter views I beg to differ, for, in the first place, lobar pneumonia is far from uncommon under the age of three years; and, secondly, the symptoms in children, even up to the age of eight or ten years, are often very different from those of the adult suffering from this disease. Henoch† says that even in the first two years of life pneumonia is by no means rare, and Holt‡ speaks of "its great frequency in early life." Loomis§ says "that from a number of statistical papers it appears that croupous pneumonia is five times more frequent during the first two years of life than in the succeeding eighteen." Moellmann,|| of 944 cases of croupous pneumonia observed by him, found 353, or 37 per cent., in children under ten years of age.

I have records of 42 cases of acute lobar pneumonia in children under ten years of age attended by myself, all but two occurring in a dispensary district, and therefore among the poorer classes. Of this number 2 died, and 40 recovered. Of the two that died, one, a male three months old, a patient at the Sea-Shore Home, was debilitated, having a large superficial abscess of the chest. He died on the third day of the disease, and the autopsy showed red hepatization of both lower lobes. The second case, a girl one year old, feeble and rachitic, died in thirty-six hours with double pneumonia. Another case, on which I made the autopsy, but which I did not see during life, a patient of Dr. Edward Reynolds, to whose kindness in allowing me to report the case I am indebted, was a male infant eight days old, who died after an illness of thirty-six hours. The *post-mortem* showed red hepatization of the entire left

* Diseases of Children, 5th ed., 1881, p. 573.

† Henoch, *Kinderkrankh.*, 1883.

‡ Holt, *N. Y. Med. Rec.*, April 7, 1888, p. 385.

§ Pepper's *Syst. of Med.*, vol. iii. p. 314.

|| Berlin *Klin. Woch.*, 1887, p. 754.

lower lobe, which was enormously distended and completely solidified.

Of the 42 cases, 5 were under one year of age (one of these being under six months), 5 were between one and two years, and 7 between two and three years, making a total of 17, or nearly one-half of the whole number, during the first two years of life; 2 were three years old, 3 were four, 2 were five, 5 were six, and 4 were seven years old; from eight to ten years inclusive there were three cases for each year; 26 were males, 16 females. The site of the pulmonary lesion was as follows in order of frequency: left base, 15 cases; right base, 13; right apex, 7; both lungs, 4; left apex, 3.

Before going further it will be interesting to compare these statistics with those to be obtained from the Collective Investigation Record on pneumonia, published in 1884, of 1066 cases of lobar pneumonia collected from the private practice of numerous English physicians. Of these cases, 170 were in children under ten years of age, 157 of whom recovered, and 13 died. Of the 13 fatal cases, 8 involved portions of both lungs, of which 1 occurred at the same time with, and another immediately followed, an attack of measles, and 1 was complicated with double empyema; 3 were under one year, 3 were one year old, 1 three years, and 1 four years; the remaining 5 were between six and eight years of age. Of the 170 cases, 25 were under three years of age, 71 between three and six years, and 72 between seven and ten years. The comparatively small number of cases reported during infancy is due, I think, not to its infrequency at that age, but to the fact that pneumonia in infants is frequently overlooked.

The portions of the lung affected in these 170 cases, in the order of their frequency, was found to be as follows: left base, 48 cases; right base, 41; both lungs, 39; right apex, 16; left lung whole, 10; left apex, 8; right lung whole, 3.

This order corresponds with that of my cases with the exception of the large proportion of cases of double pneumonia, which makes me suspect that some of these were in reality broncho-pneumonia.

Although acute lobar pneumonia in infants and young children is frequently not recognized, and the child is thought to

have a febricula, or meningitis, or possibly only a tonsillitis, the physician finding redness and slight swelling of the fauces, and knowing that a slight throat-trouble in a child will often cause a high temperature, yet it seems to me there is no disease which in most cases is so distinctly marked, if we can watch the case from beginning to end, can have a complete temperature record, and are not forced by an importunate family to make a diagnosis at the first visit. In the adult there are five cardinal symptoms which are nearly always present,—namely, sudden onset, marked by a rigor, or, at least, chilly sensation, pain on the affected side, generally in the region of the nipple, cough, characteristic viscid, rusty, or bloody expectoration, and, lastly, a continued high temperature. Those who look for this collection of symptoms in infants and young children, in order to make a diagnosis, will generally be disappointed.

The sudden onset is characteristic of pneumonia in the child as well as in the adult; but in the former the nervous disturbance, instead of taking the form of a chill, appears most frequently in the form of vomiting, and occasionally as a convulsion. Initial vomiting occurred in 31 of my 42 cases, convulsions in 3; chilly sensations were noticed in 9, and a true rigor in only 3,—2 boys of ten years, and 1 of seven years. It is interesting to note here that in one case, a boy of two and a half years, where convulsions occurred, there were also slight trembling movements, which the parents thought resembled a chill.

In the British collective cases, vomiting or “sickness” at the onset occurred in 45, convulsions in 4, rigor in 79, and chilliness in 4. The large number reported to have had a rigor is rather surprising, and also that of these, 22 were under six years of age, 9 being five years old, 1 four, 3 three, as many as 7 only two years, and 2 one year old. It is generally supposed that rigors at these ages are very rare, and my observations confirm this. Holt* states he has not seen a rigor in a child under seven years of age.

The second symptom, of pain localized in the affected side, so constant in adults, is very often wanting in children. That

* N. Y. Med. Rec., 1885, xxvii. p. 174.

pain is present in pneumonia in children is evident from their fretfulness and look of suffering; but even if the child is old enough to talk and understand our question relative to the seat of pain, its answer is often misleading, as it refers the pain to some other region. That the pain is in reality in the same place as in the adult is, of course, probable, but the difficulty is that the power of localizing sensations seems to be deficient in the child. In 14 of my cases pain, although evidently present, could not be localized. These cases were all under two and a half years of age. In 25 cases the site of pain is mentioned, in 7 of which the pain was referred to the affected side alone, all of these children being six years old or older. In 8 the pain was referred to the abdomen alone, and all were under seven years of age. In 3 others,—2 ten years old, and 1 four years old,—the abdomen was the chief seat of the pain, but they also complained at times of pain in the affected side; 1, eight years old, besides abdominal pain, which was chiefly epigastric, complained also of pain in the axilla of the affected side. A boy of seven complained at first of epigastric pain, later of pain in the side. A boy of nine persisted in complaining of pain all over his body, but most intense in the epigastrium; and 2 infants, between two and three years old, localized the pain in the substernal and epigastric regions. Thus, 16 out of the 25 cases complained more or less of abdominal pain. A large number complained of headache, and 2, aged respectively three and five years, said the pain was in the head and nowhere else.

How different this is from what occurs in the adult, where pain in the affected side, often in a small space in the region of the nipple, is a symptom rarely absent.

The symptom of cough was present at some time in all of my cases, being generally a slight, moderately frequent, hacking one, with a rather characteristic loose sound, and is so described in my notes in 22 cases. In 7 other cases it was at times very frequent, becoming an incessant slight hacking, very distressing to the patient. In 4 cases the cough was very infrequent, in 1 of which, a boy of ten years, coughing occurred scarcely more than a dozen times during the whole course of the disease, and this would not have been noticed if I

had not directed the parents' attention to it. In 6 cases no cough at all was noticed at the onset, in 3 of these that symptom appearing on the third day, in 1 on the second day, and in 2 not till the fourth day. The cough, as a rule, became more frequent as the termination of the disease was approached, and generally continued for two or three days after the fall of temperature.

The viscid, rusty expectoration so characteristic of pneumonia in the adult did not occur in my cases. Indeed, expectoration rarely occurs in children under eight years of age, except in whooping-cough, where, owing to the violence of the paroxysms and the large quantity of the secretions, some is not infrequently allowed to run out of the mouth or is actually expectorated, and children with chronic lung diseases or pharyngeal catarrh sometimes learn at quite an early age to expectorate. In pneumonia the mucus, if it be coughed up into the mouth, is generally swallowed unconsciously, the child not knowing enough to spit it out. Of all my cases, expectoration occurred in only three patients, aged respectively seven, eight, and nine years, and in none of these cases was the mucus rusty or tinged with blood.

The last symptom mentioned in the list of adult symptoms, namely, the continued high temperature, was a characteristic feature of these cases, and one which is of much importance in making the diagnosis. With the exception of a few of the earlier dispensary cases, where my temperature records are imperfect, I was so fortunate as to obtain a complete morning and evening chart of the cases, through the valuable assistance of the district nurse. Of 37 cases, 29 ended by crisis and 8 by lysis, the proportion of those ending by crisis being considerably greater than is usually found in statistics of cases in adults, and is indeed greater than in the British cases before referred to. Here, in 154 cases in children, 87 ended by crisis and 67 by lysis, and it is possible that some cases of bronchopneumonia included in the list may account for this difference. Henoch,* of 45 cases, found 37 to end by crisis and 8 by lysis. The critical fall of temperature in my cases occurred in 2 on

* Loc. cit., p. 352.

the third day, in 3 on the fifth day, in 5 on the sixth, in 11 on the seventh,—which was, therefore, the favorite day,—in 3 on the eighth, in 1 each on the ninth, twelfth, and fourteenth days, and in 2 on the thirteenth day. The temperature reached normal by lysis in 1 each on the eighth, tenth, fourteenth, and fifteenth days, and in 2 on the eleventh and also the twenty-first days. In the British cases the favorite day for the crisis was also the seventh, the drop of temperature occurring in 18 on this day. In 13 cases crisis occurred on the sixth day, and in the same number on the eighth day. In 11 the crisis occurred on the fourth day, in 8 on the fifth and also the ninth day, in 5 on the third day, in 4 on the tenth day, in 3 on the eleventh day, and in 1 each on the second, twelfth, thirteenth, fourteenth, and twenty-sixth days.

An examination of my temperature charts shows the continued high temperature, generally about 104° ; with little or no remissions. The highest temperature reached was 106.2° in one instance. Only five failed to reach 104° , and all but one of these were seen for the first time only the day before the crisis, and it is possible the temperature may have been higher previously. None failed to reach 103° . Several temperatures after reaching normal by crisis rebounded once or twice nearly as high as they were before. In many the temperature was subnormal for a day or two after the crisis. The change in the spirits of the little child on the fall of temperature was often very sudden, and it would be found sitting up in its crib laughing and playing with its toys, while on the day before it had been in a state of fretfulness and suffering. The cough meanwhile would continue as before, or even be more frequent for a day or two, and the physical signs in some cases were to be found unchanged. An examination of my records when this was determined, shows that the physical signs disappeared on the same day that the temperature reached normal in 5, on the day following in 5, two days following in 2, three days in 3, four days in 1, five days in 1, nine days in 1, and in 1 case resolution was delayed for sixty-four days or two months after the fever, which lasted twenty-one days, had ceased. Goodhart* says of these prolonged cases: "Acute

* Diseases of Children: Revised by Starr, 1885.

pneumonia, running a rather more chronic course than we think it should do, arouses our fears only to dispel them." Henoch* speaks of these cases under the head of chronic pneumonia, and relates a case almost identical with mine, of a child six years old where fibrinous consolidation of the right lower lobe lasted for two months, the initial fever lasting fourteen days; later a slight rise of temperature occurred at times. He considers this prolonged course more common in children than in adults. Prolonged cases of broncho-pneumonia with consolidation of an entire lobe are also not uncommon, and are to be distinguished by their history from cases of the true lobar form. In these prolonged cases young children frequently learn to expectorate, and the sputa may be streaked with blood. Phthisis is, of course, always to be feared, and without the diagnostic tubercle bacilli we can only wait for time to show the nature of the disease. Remembering, therefore, the possibility of chronic pneumonia, whether fibrinous or catarrhal, in children, our diagnosis and prognosis in chronic cases of lung consolidation should be guarded and not necessarily unfavorable.

In one of my cases the physical signs disappeared twenty-four hours before the final crisis. Henoch relates a similar case, and quotes Sidlo† and Grisolle‡ as saying that this clearing up of the physical signs before the fall of temperature occurs in a certain proportion of the cases.

Physical signs are, on the other hand, often tardy in showing themselves in children, owing to the fact that the lesion may at first be small and centrally situated, coming to the surface so as to be recognized only at a later stage. In 25 of my cases the physical signs were present at the first visit, which was on or after the second day. In 6 of the remaining 16 cases the signs did not appear till the third day, in 6 till the fourth day, in 3 till the fifth day, and in 1 each not till the sixth and seventh day. Careful thoracic examinations were made daily until the signs were found in all cases. It some-

* Loc. cit., p. 358.

† Deutsches Archiv f. Klin. Med., xiv. p. 348.

‡ Traité de la Pneumonie, p. 307.

times happens that the respiratory sounds are only slightly broncho-vesicular and free from râles while the child is breathing quietly, but on deep inspiration, caused, for example, by the child's crying, respiration becomes plainly bronchial and râles are heard in abundance. This was noticed particularly during the days when the signs were clearing up.

The true crepitant râle is not so often heard as in the pneumonia of the adult. Lewis Smith* says that in the majority of patients under three years of age the crepitant râle is not observed. For local fremitus and resonance crying must be depended on, if the child will not or cannot speak. The large size of the liver in infants should be remembered. A tight belly-band or a violent expiration may force the liver up so that dulness is obtained nearly as high as the spine of the scapula on the right side.

Charts I. and II.† are inserted as typical examples. Chart III., a boy two years old, who was seen from the first day, began with a consolidation of the right base, the temperature running from 103° to 105° and dropping suddenly to 100.4° on the eighth day. It went up again that night and a lesion of the left base showed itself. On the seventh day of this attack the temperature dropped to 97.8° , but again rose the following day, and the right apex was then found to be involved. On the eleventh day of this third attack the temperature fell to normal, where it remained, and the child regained perfect health. One case (Chart IV.), a boy of seven years, was seen on the second day after the initial vomiting, and was found to have a temperature of 104.6° and no signs in the lungs; the next day the temperature fell to 100° , between which point and 98.5° it remained till the ninth day, when it remained normal. Signs of consolidation of the left base were found only after the fall of the temperature to 100° , and these

* Loc. cit., p. 583.

† Note the "inversion of the thermic curve" in this case,—i.e., a higher morning than evening temperature. This is the only one of my cases where it was observed, but it has been noticed occasionally by others in the pneumonia of children. *Vide* Coriveaud, "Sur l'inversion de la courbe thermique dans certaines pneumonies infantiles," *J. de Méd. de Bordeaux*, 1885, xv. 391, also Keating, *Arch. of Pediat.*, iii. 76.

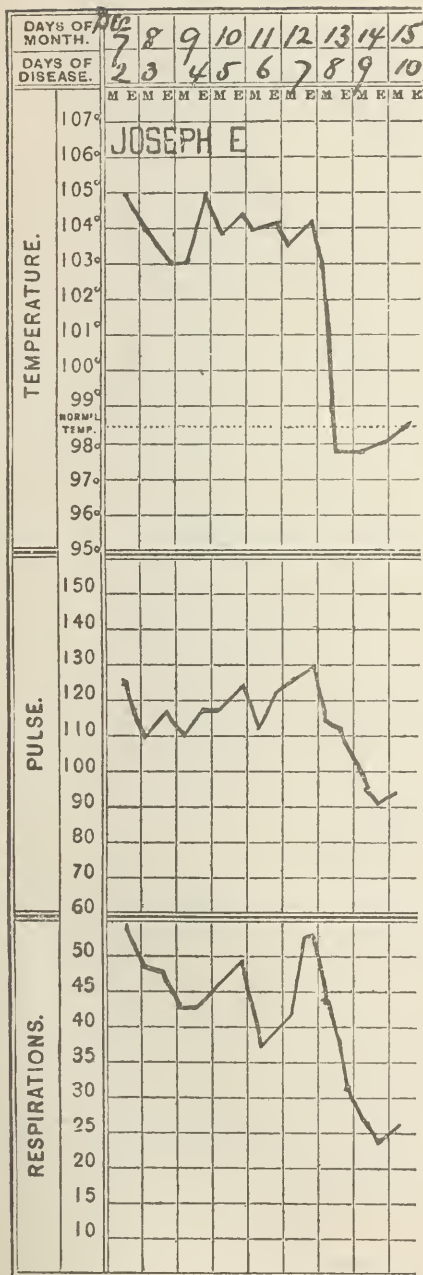


CHART II.

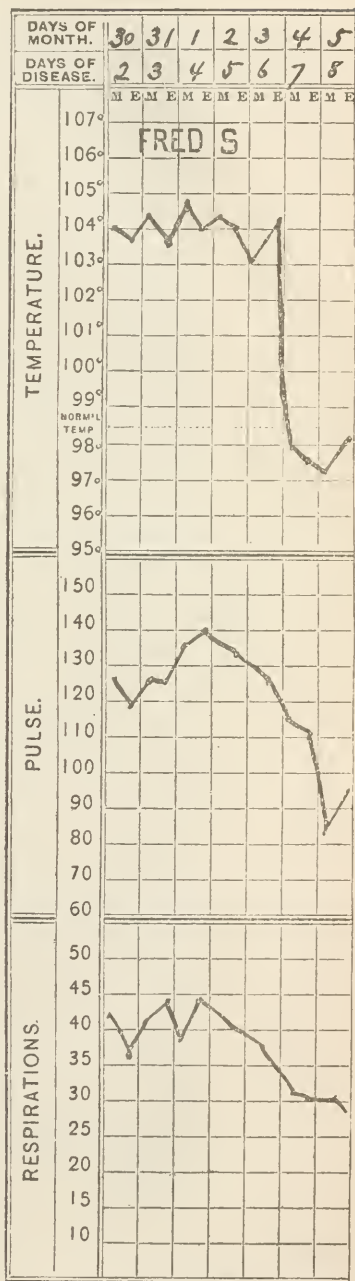


CHART III.

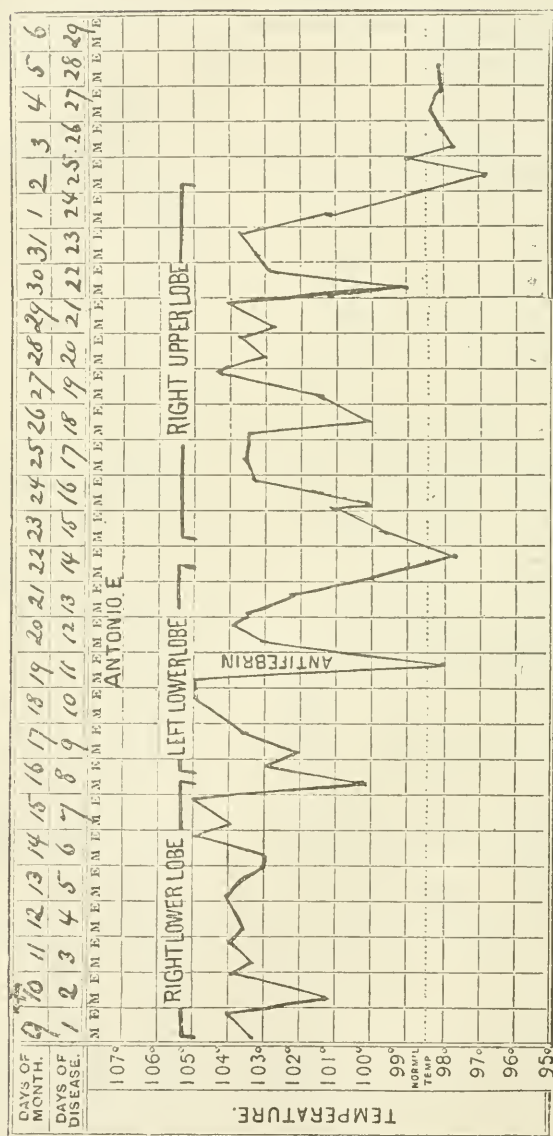


CHART IV.

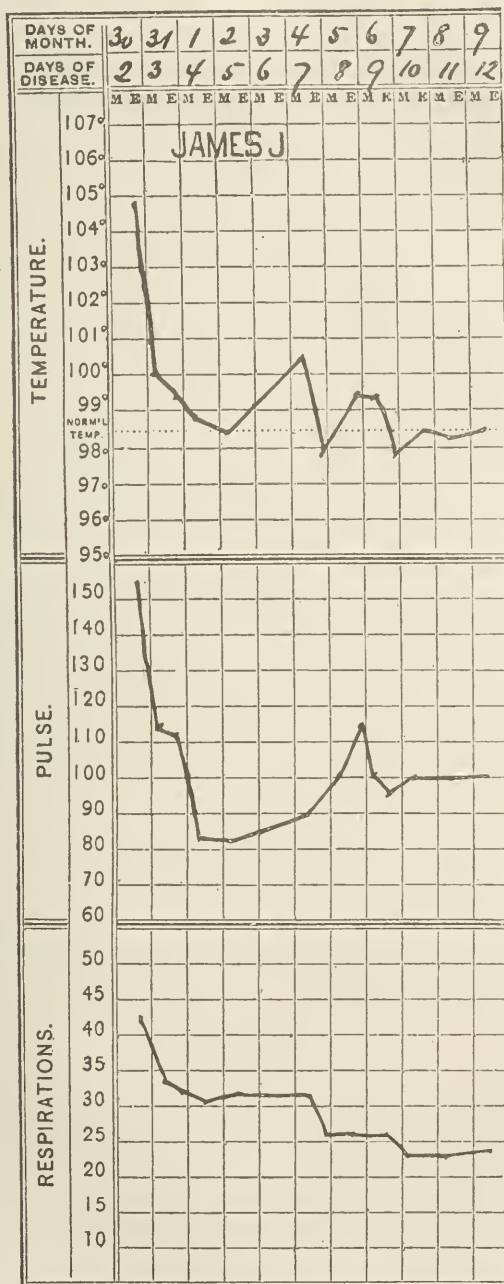
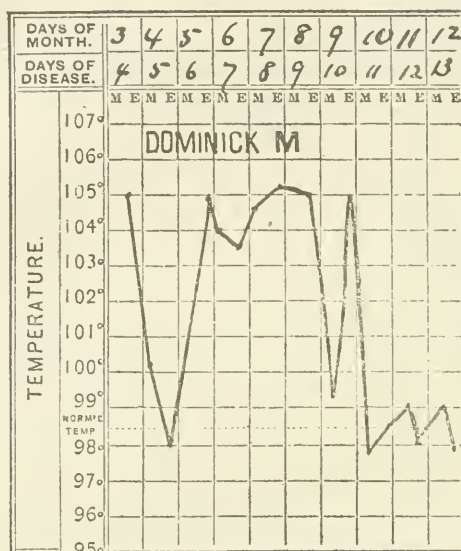


CHART V.



signs were very unmistakable. In a child of two and a half years (Chart V.), a sudden attack of vomiting was followed by fever, which lasted five days, without the appearance of physical signs; on the fifth day the temperature was normal, the child feeling very well, and I supposed that I had had to deal with a bronchitis with considerable fever or a case of abortive pneumonia. The next day, however, the temperature rose to 105°, when it remained for five days, and complete consolidation of the left base was found. It is possible that in the first attack there had been some small central lesion of another lobe, which could not be detected by physical examination, or which I had overlooked. It seems very probable, therefore, that some of the unexplained febriculas of children are in reality due to acute lobar pneumonia. In my note-books I have 32 cases in children diagnosticated as febriculas. Of these, 16 were of a mild typhoid type, of brief duration; some of them undoubtedly should have been called typhoid fever. In 2 others urticaria was a prominent symptom. In 4 nervous symptoms with headache were marked. In 1 case the temperature remained up for a day, following a

convulsion. Three cases were thought to be caused by a short acute bronchitis, dilatation of the alæ nasi and expiratory moan being noted in 1, with pain in the epigastrium. In this case the temperature fell from 103° in the morning to 100° in the afternoon of the first day of the attack, and was normal in the next day. This case certainly strongly suggests abortive pneumonia. Five cases began suddenly with vomiting, had a slight cough in all but 1 case, with a temperature reaching 105° in 1 case, 103° in the others, and ending by crisis on the sixth day in 3, on the fifth in 1, the remaining case ending by lysis on the sixth day. In one of the cases herpes labialis also occurred. In none of the cases could physical signs in the lungs be detected, and although, for lack of positive proof, I have not included them in my list of cases of pneumonia analyzed above, still I am inclined to think that some of them were true cases of lobar pneumonia. Of course I may have overlooked definite signs, or the lesion may have been so centrally situated and covered by healthy lung tissue that signs could not be obtained. It is interesting to note that in the same room with the last case spoken of above, a child of five years, without definite symptoms or signs, had a temperature reaching 103.8° , lasting two days. The infectious nature of pneumonia and the occurrence of several cases of the disease in the same house is a subject of great interest, which I will not discuss now.

(To be concluded.)

THE TREATMENT OF INCONTINENCE OF URINE IN CHILDREN BY THE SOUND.

BY J. E. CLARK, M.D.,
Brooklyn.

IN a practice of nearly forty years I have had many of these cases to treat, and, while many have been cured, relapses have been frequent, and the child would be troubled from time to time until it arrived at puberty, when the difficulty generally ceased.

I have given nearly all the remedies suggested, such as bel-

ladonna, ergot, cantharides, etc., but have come to rely mostly on the first two mentioned. After all, the treatment was not satisfactory. In thinking over the case I was led to suspect that we had a condition of irritable urethra, such as we have in the adult in cases of spermatorrhœa, and that it could be cured as we cure those cases, by the passage of the metallic sound.

Examination proved my surmise to be correct, and I believe that in all uncomplicated cases the sound is the correct remedy to use.

I have never found any stricture, as suggested by Dr. Earle in his excellent article in the December number of the ARCHIVES OF PEDIATRICS, only a spasmodic resistance to the passage of the sound, sometimes called spasmodic stricture, although it is possible that long-continued irritation might produce stricture.

Method of using the sound.—I need hardly say that in introducing the sound the utmost gentleness is to be exercised. It should be manipulated gently, as far as it will go without force, left in a few minutes, and then withdrawn. After an interval of five or six days the procedure is to be repeated, when it will be found that there is less irritation in the anterior portion of the urethra, and the sound will go more easily and farther; but, if there is much resistance, the operation must cease. It will not probably be until the third attempt that the sound passes readily into the bladder. After that the size of the sound can be increased, and a few more applications will completely subdue the irritation.

It is not desirable to dilate the urethra in the child above its natural size. Such attempts do harm. I think No. 9 English is as large as most children under twelve years of age will bear.

The following case will be sufficient to illustrate the subject :

Charles B., thirteen years old, light hair, nervous temperament, presbyopic. I had treated him for years, off and on, for incontinence of urine. April 2, 1888, I commenced treatment with the sound, and found the urethra exceedingly irritable; would admit the No. 8 but a short distance. I introduced the No. 7 to the membranous portion.

From April 9 to 28 I repeated the operation six times. At

the last date I used the No. 9, and had done so three or four times before. The irritation seemed entirely allayed, and treatment was discontinued.

I saw the boy a few days ago, and learned that he had been entirely free from the difficulty ever since.

PEDIATRICS.

IN answer to many inquiries as to the origin and meaning of the word "Pediatrics" it may be sufficient to say that the term designates the treatment of the diseases of children and the preservation of their health. The term is to be found in the form *Pædiatria* in the medical dictionaries of Dunglison and Thomas, and in the more recent form "Pediatrics" it is to be found in the "Comprehensive" and "New Academic" dictionaries of the Worcester series. The word is derived from the Greek *παῖς*, *παῖδος*, "a child," and *ιατρικός*, "medicinal;" *ιατρική*, "the healing art;" *ιατρική (τέχνη)*, "medicine" or "surgery;" and is in all respects a regularly constituted and legitimate word.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Weller: *Management of the New-Born Child.* (*Med. and Surg. Reporter*, November 10, 1888.)

In a short communication on the dress of the infant the writer condemns the use of the abdominal bandage. It causes discomfort by preventing the elastic abdominal wall from accommodating itself to the varying conditions of the intestines. A baby is usually subject to flatulence, and, if not bandaged, rarely suffers any inconvenience from it, because the elasticity of the walls allows the flatus to move freely through the intestines. He thinks a little reflection will show that the band favors rather than guards against rupture, notwithstanding the teaching that it is a preventive against this evil. The band protects the stronger parts, and not only leaves the weaker unprotected, but endangers them by throwing upon them the whole force of any concussion, as from sneezing or coughing.

Scatliff, J. M. E.: Night-Terror and Screaming in a Child cured by Removal of the Tonsils. (*The Lancet*, October 6, 1888.)

The boy was about seven years of age, and to all appearances was in good health. He seemed to be quite well all day, but every night, after he had been asleep some little time, he used to wake up in a state of great terror. In a short time he got over the attacks, and would lie down quietly to sleep again. The boy was examined, and nothing was found except large hypertrophied tonsils. These were conjectured to be the cause of the alarming symptoms. They were at once both removed. The child promptly got rid of his night-terror and screaming.

It was presumed that in deep sleep, when he lay in some unfavorable position, the tonsils obstructed the respiration, so as to cause imperfect aeration of the blood, and the disturbed mental condition.

Snell, Simeon: Prevention of Blindness following the Ophthalmia of the New-Born. (*The Lancet*, September 1, 1888.)

In the midwifery department of the Jessop Hospital a simple preventive plan is in use. Immediately after the head of the child is born, the eyes, as well as the eyelids and parts close adjoining, are carefully washed with little pieces of lint moistened in clean tepid water. Subsequently, in washing the child, care is taken to guard against reinfection.

The plan is remarkably simple, and the absence of any application, such as nitrate of silver, to the eyes renders it very easy of adoption by nurses. Its success clearly depends on washing away secretions from and near the eyes before the child has opened them, and before infection has taken place.

No previous cleansing of the parturient canal and external genitals of the mother is necessary. The success which has attended the use of this plan at the Jessop Hospital renders it worthy of more extended employment.

After delivery, as soon as a child's eyes begin to look in any way red, a drop of nitrate of silver solution (two to five grains to the ounce) should be dropped into the eye.

Niven, James: A Practical Point in Connection with Primary Vaccination. (*The Lancet*, July 7, 1888.)

Vaccinated persons protected by only one vaccination may aid in spreading an outbreak of smallpox. They may have the disease in a mild form; and since there are medical men in practice who have, probably, never seen a case of small-

pox, it is little wonder that they fail to see smallpox in the trivial and atypical cases which come before them. The author reports a number of cases to prove that the amelioration of smallpox by primary vaccination is liable to become a factor in the propagation of the disease, in the absence of the renewal of protection. To what extent it will be so depends on the character of the people, and on the amount of experience of all the medical men of any given district. The author says, however, that if there were no vaccination we should escape altogether these difficulties of diagnosis. He has seen an unvaccinated case where there were only two pox, and another unmodified case about just like a modified one. The remedy lies either in compulsory notification or in an enforced second vaccination at the age of twelve, or even of a third, at a later time.

Veillard: Treatment of Choleriform Diarrhoea in Children with Fluid Diet. (*Jour. de Méd.*, November 11, 1888.)

The method in question is one which is eminently antiseptic, the idea being to remove all fermented matter contained in the digestive tube, and to prevent new toxic substances from entering the organism: If milk is taken by the bottle the child should receive no other kind of food, and no water should be put into the bottle excepting that which has been boiled or distilled. Some writers prefer to discard the bottle altogether and to feed the child only with a glass or a spoon. Since boiled or distilled water is not always well received by the stomach one may add a few drops of brandy to it. A weak mineral water, which is always aseptic, may be substituted for boiled water. The waters of Vals, Condillac, Alet, and Saint Galmier are frequently used in this manner. Water being thus freely given in diarrhoeal cases, the digestive tube is washed out, as it were. There is no objection to the addition of a weak antiseptic, like boracic acid, to the water. There is no trouble in administering quantities of water, as children with this disease are eager for water. For the vomiting which occurs at the beginning of the disease one may give small doses of opium, or Seltzer water, and for the intestinal discharges, nitrate of silver and ipecacuanha, either in the form of a potion or as an enema.

A. F. C.

Grancher: Treatment of Diphtheria by Antiseptic Cauterizations. (*Le Concours*, December 1, 1888.)

The author has previously reported seventeen cures in the same number of cases of diphtheritic angina treated by cauterization with concentrated carbolic acid mixed with camphor.

He now adds the experience of a colleague with the same method. Since 1884 this colleague has treated eighty-one cases of diphtheritic angina by this method. Of these eighty-one there were thirty infants; thirty-one were from three to twelve years of age, and twenty were from twelve to forty-six. Only four cases were fatal, death being due in all cases to obstruction of the larynx with false membrane. These results demonstrate to the author the value of the method. In order to be effective, the application of the mixture to the throat must be so energetic as to completely cover the false membrane, and it must be made two or three times daily by the physician himself. In addition, the mouth should be washed out with carbolized water during the intervals of cauterization. This treatment is applicable to very young children, though it does not usually succeed as well with them as with older children. The reaction from the carbolic acid was not more decided than is produced by any of the agents which are used for cauterizing the throat. The urine became dark in some cases, which showed that there had been absorption; but no serious consequences followed.

Labbé, in commenting upon this method, thought it unwarrantable to use sufficient violence to remove the epithelium from the mucous membrane, as it opened the door for septic absorption. Hydrochloric acid was advised by Trousseau as a caustic application for diphtheria: but it never cured any one.

A. F. C.

Faucher: Irrigation of the Stomach in Very Young Children. (*Le Concours*, December 15, 1888.)

The author, who is the inventor of a tube for irrigation of the stomach, has applied it to children of the first period of life. This operation has long been practised in Germany upon children, and with good success. Irrigation of the stomach may be accomplished with the new-born almost as readily as with adults by the aid of a tube and funnel of suitable dimensions. The infant should be held with the head forward, so as to admit of the ready exit of matter which may flow back into the pharynx, the arms being secured under a napkin, which is tied around the neck. The author entirely disapproves of the plan of Ebstein, in keeping the child in the dorsal position while this operation is being performed. A case is narrated in which a child presented grave symptoms of gastro-intestinal disorder twenty-seven days after birth. The author washed out his stomach three times the first and the second days, and twice on the third day, the result being that the vomiting was soon arrested. The period of digestion,

which at first lasted four hours, was gradually shortened, the child became quieter, the evacuations became regular, and a normal condition supervened. No medicine was given.

A. F. C.

Calatraveus: What Form of Alimentation is Least Harmful during the First Period of Life if Nourishment from the Breast is Unobtainable? (*Anales de Obstet. Ginecop. y Pediat.*, October, 1888.)

This paper was read before the Spanish Gynæcological Congress of 1888, and the following are its conclusions:

1. Alimentation of children during the first period of life is the greatest problem in pediatrics. The individual is formed by this means, and by appropriate nutrition are determined modifications of temperament and peculiarities of disposition which will fit children, if healthy and robust, for usefulness to the community and their country.

2. Bad alimentary regimen, abuse of mixtures of milk, meal, etc., result in denutrition and death after one has passed through the series of conditions which were included by Parrot in the term *athrepsia*.

3. No food can properly be substituted for milk during the first period of life; all mothers should, therefore, nurse their children from obligation as well as from personal satisfaction. They thus fulfil their duty as mothers, and may also avoid a great multitude of utero-ovarian pains, which are likely to come to those who do not experience lactation.

4. The physician alone is competent to decide whether a woman should refrain from nursing on account of general debility or of present or prospective illness, and while he should urge the healthy to nurse their infants, he should also advise the sickly and diseased not to do it.

5. The milk of a wet-nurse residing in the same house with the child is the best substitute for that of the mother. Of course, the wet-nurse's character and habits must be thoroughly known, and the existence of syphilis, alcoholism, or scrofula must be absolutely determined in every candidate for wet-nursing in whom it exists.

6. The bottle holds the third place in the series of means for the alimentation of infants. It should not be confided to careless hands: it should be kept rigorously clean, at a proper temperature, and the liquids which it may contain should be irreproachable.

7. Of the different forms of animal milk which may be used, that from the ass and the goat are preferable to that from the cow. If goats' or cows' milk is to be used during the first

months of life, it should be mixed with barley or oat-meal water in the proper proportion.

8. All advertised foods for children are to be condemned, especially condensed milk.

9. Of all the substitutes for woman's milk, that which is obtained by the formula of Coulier most resembles it.

A. F. C.

Lichtermann: The Treatment of Diphtheria. (*El Progreso Ginecol. y Pediatra*, November 10, 1888.)

The following method of treatment has been used by the author in more than three hundred cases of diphtheria in a locality in which diphtheria seems endemic. When called to see a patient he at once has the largest room in the house disinfected with chlorine. After keeping it closed for an hour and submitted to the influence of the gas, the room is opened and ventilated, and the patient is removed to it. Then a mustard foot-bath, at a temperature of 30° C., is given for fifteen minutes, after which the patient is wrapped in a woollen covering and allowed to sweat for two or three hours. This bath is repeated every afternoon. The local treatment consists in (1) applying a solution of one gramme of salicylate of soda in two of glycerin to the posterior portion of the pharynx four times daily; (2) gargling the throat every half-hour with a solution containing six grammes of chlorate of potash to one hundred and eighty of water. For internal treatment two mixtures are used, one containing three grammes of chlorate of potash, one hundred and eighty grammes of distilled water, and thirty of simple syrup, to be taken in teaspoonful doses every hour; and the other containing three grammes of hydrochloric acid, one hundred and eighty of distilled water, and thirty of fruit syrup, also to be taken in teaspoonful doses every hour, immediately after the first medicine has been taken. Children under two years of age should take only half-teaspoonful doses of each mixture, and to those more than two years of age half a tablespoonful may be given. A three-per-cent. solution of carbolic acid should be atomized in the room. After twenty-four hours of this treatment the temperature of the patient will be normal, and after forty-eight hours the false membrane will have completely disappeared. Until April, 1886, the author had been in the habit of treating diphtheria, as it is commonly treated, with a mortality of forty-five per cent. From April, 1886, to October, 1887, he treated two hundred and thirty-seven cases, sixty-eight of which were of gangrenous form. In all these cases the method of treatment was the one which has

been described, and there were only four deaths among them. His explanation of the treatment which he has adopted is the following:

1. Under the influence of sweating the specific gravity of the blood increases, the proportion of salts in solution increasing. According to Hachsmuth, such a medium is unfavorable for the development of the microbes of diphtheria.

2. The use of chlorate of potash contributes to this concentration of the blood.

3. Under the influence of the simultaneous administration of hydrochloric acid and chlorate of potash, acids of chlorine are developed which act powerfully as oxidizers and microbicides.

A. F. C.

Landouzy: Early Infancy as an Organic Medium in its Relations to Tuberculosis. (*Le Concours Méd.*, August 18, 1888.)

The clinical phenomena of tuberculosis as it is seen in adults, aged people or children, differ from each other so much in the different social conditions that one is tempted to ask whether the morbid condition is the same in all. In early infancy tuberculosis takes the form of a general disease. In place of being manifested by meningeal, digestive, or peritoneal disorder, it presents itself as a disease of the entire organism, which is accompanied with high fever. An autopsy in such a case may not reveal any granulations in the spleen, liver, etc., while the organs may be swollen, and even the plaques of Peyer may be hypertrophied. Tuberculosis is also frequently manifested by digestive disturbances without the presence of true tuberculous granulations. In such cases there may be an attack of broncho-pneumonia, in the course of which the bacilli of tuberculosis are discoverable. Such a series of events not infrequently occur in connection with measles; the organism of some young children in this disease being converted into a sort of culture medium for the bacillus, which subsequently gives rise to the dyscrasic and thermic conditions of tuberculosis. The author believes that tuberculosis is much more frequent in childhood than writers upon the subject have supposed, but that it is masked under what appears to be a simple inflammatory disease. With regard to the pathogeny of tuberculosis in children, alimentation is a subject of great importance, especially when that is supplied by milk from an artificial source. The fact that tuberculosis in children is so common, and in calves so rare, suggests that something must be wrong with the way in which children are brought up. Prophylaxis of this disease in children may be

realized in great measure, therefore, by always giving boiled rather than raw milk. The skin and the respiratory organs are also media by which the infection of tuberculosis may be communicated. Heredity also plays an important part in the pathogeny of tuberculosis, and a child of tuberculous parents not only receives at birth a favorable soil for the germination of the disease, but, it may be, the very elements themselves which will produce the disease. The injurious influence of alcoholism and syphilis in parents upon their offspring is well known; equally important is the influence of tuberculous parents upon their offspring, and it should receive proper attention and regulation.

A. F. C.

Raven: Treatment of Diphtheria and Tonsillitis. (*Rev. Mens. des Mal. de l'Enf.*, May, 1888.)

Many authors believe that membranous angina is an evident symptom of the disease called diphtheria. Others admit that angina with membranous deposits is sometimes met sporadically, sometimes as an epidemic, having all the local appearances of diphtheria; and they consider that such cases are to be very carefully distinguished from diphtheritic angina. In this latter view the author coincides. A recent severe epidemic of exudative amygdalitis in a school containing eighty children came under his observation. The disease was of the sthenic type, and the local appearance of the patches which covered a considerable portion of the pharyngeal mucous membrane was not different from the appearance of diphtheritic patches. Almost all the cases were severe, the temperature at the beginning reaching 105° , and having frequent fluctuations. In three cases acute articular rheumatism with cardiac trouble formed a complication. The disease was extremely infectious, and was attributable to poisoning from sewer gas. The usual treatment for diphtheria, sulphurous acid, biniodide of mercury, sulphite of magnesia, and turpentine, was to all appearances indicated; but instead, the author kept his patients under close observation, and gave them large doses of chlorate of potash. During the entire epidemic albuminuria was not present in a single case, there was no submaxillary adenitis, and no subsequent paralysis or peripheral neuritis.

Since the preceding experience was had the author has passed through another epidemic of the same character, but of less intensity. There were thirteen cases of exudative tonsillitis, some of them mild, others more severe. In one of the cases the symptoms were at one time so severe that tracheotomy seemed indicated; but they subsequently became less urgent. To none of the patients was any drug given

except chlorate of potash, and in none of the cases were there any of the bad results which usually follow diphtheria. The disease in this instance also was due to sewer-gas poisoning, and seemed to be quite contagious.

A. F. C.

Rachel: The Treatment of Whooping-Cough with the Chloride of Gold and Sodium. (*New Yorker Med. Presse*, August, 1888.)

The treatment of whooping-cough by belladonna, which has been in vogue for some years, has occasionally yielded good results in the author's hands. He was induced, however, by the favorable reports published by Magruder of the use of chloride of gold and sodium in the treatment of this disease, to give it a trial, and for the past two or three years has continued to use it with satisfaction, either alone or in combination with tincture of opium; a two-per-cent. solution of the chloride is used, and five to eight drops in water are given every two hours. The number of paroxysms will soon be reduced, and also the duration of each. If, after two or three days, improvement should be very slight, the dose may be cautiously increased. The resulting improvement will be especially marked by the freedom from paroxysms at night. The writer has used as large doses as fifteen drops of the two-per-cent. solution every two hours. The duration of the disease may be shortened by weeks, or even months, by this treatment. After two or three weeks of treatment the paroxysms become limited to a small number daily, and not of great severity. After four or five weeks the disease is usually entirely overcome. No special directions seem necessary in regard to possible complications; it would seem an obvious duty to remove mucus from the throat with the finger, if it should accumulate there. The addition of a few drops of tincture of opium to each dose of the chloride will be of service if there is sleeplessness or pain from pneumonic exudation.

A. F. C.

Comby: Treatment of Rachitis by Phosphorus. (*El Prog. Gin. y Ped.*, March 25, 1888.)

In view of the importance which has been attached to this method of treatment, and the different opinions which have been advanced, the author undertook some personal investigations, the results of which were communicated to the Medical Society of the Hospitals of Paris. During a period of eighteen months he administered a phosphorated preparation of cod-liver oil, containing ten centigrammes of phosphorus to a litre

of oil, to forty rachitic children from ten to thirty months of age. The younger ones received one to two teaspoonfuls of the mixture daily, and the older ones four teaspoonfuls; the latter obtaining thereby one milligramme of phosphorus daily, as recommended by Kassowitz. The treatment was continued during periods of three, six, and, in a few cases, twelve months. It was well tolerated in all cases. In twenty-one there was improvement, which was more or less decided; in eighteen there was no change; and one became worse. The bony incurvations were not improved, even in those cases in which treatment was continued for twelve months. For purposes of comparison, forty other rachitic children were treated with salt-baths, some of them also receiving cod-liver oil or phosphate of lime. The results in this second series were two complete cures, thirty-four in which there was improvement, and four in which there was no perceptible change. Rachitis is usually due to disobedience of hygienic rules; hygiene, therefore, should receive primary consideration in treating the disease. The most active agents for the relief of the disease are those which will increase and fortify the nutrition,—exercise in the fields or by the sea-shore, and natural or artificial salt-baths. The medicaments, cod-liver oil, phosphate of lime, and phosphorus, are of minor consideration.

A. F. C.

Pierron: Treatment of Acute Simple Bronchitis in Children. (*Jour. de Méd.*, September 16, 1888.)

If acute bronchitis is without complications, its treatment may be limited to hygienic attention, a mild and equable temperature in the bedchamber, rest in bed, and a light diet. If the child is still nursing, it should not be weaned nor the intervals between nursings lengthened; on the other hand, if the child has been recently weaned, it should again be put to the breast. Older children should be given soups, beef-tea, milk, and eggs. In some cases the indications will be for an emetic, a laxative, or mild revulsives, in order to stimulate the bronchial secreting function. Should the simple bronchitis show a tendency to persist and to develop into a rebellious bronchial catarrh, powerful revulsives must be used, repeated fumigations must be practised, and mild purgatives and emetics be given every day or every two days. Cod-liver oil and other tonics should be administered, and one of the following formulæ:

R Syr. ipecac, 15 grammes;
 Syr. ol. terebinthinæ, 30 grammes;
 Decoc. polygalæ, 100 grammes.
 Teaspoonful every hour.

- R Kermes, 0.30 gramme;
Syr. rum., 25 grammes;
Syr. potass. brom., 15 grammes;
Syr. eucalypti, 30 grammes;
Infus. violets, 100 grammes.
Teaspoonful every hour.
- R Syr. sodii monosulph., 20 grammes;
Potass. chlor., 2 grammes;
Aq. comn., 120 grammes.
Teaspoonful every hour.

The treatment of acute general bronchitis and capillary bronchitis, when both are uncomplicated, is the same, but it implies constant care and attention. At the beginning energetic revulsives are indicated, but no vesication, emetics, and the general *régime* of simple bronchitis. Expectorants will be of service, and by their nauseating effect will favor elimination of morbid products. The following formula will be found serviceable:

- R Kermes, 0.20 gramme;
Tinct. digital., gtt. v.;
Tinct. belladonnæ, gtt. x.;
Syr. ipecac., 12.00 grammes;
Vini malagæ, 20.00 grammes;
Decoc. polygalæ, 100.00 grammes.
Q.S.

Should dyspnœa become urgent, dry cups should frequently be applied, flying-blisters should be used, oxygen should be inhaled, and the atmosphere should be kept moist with suitable medicaments. Inhalations of ether or chloroform may also be used, or of hydriodic ether, hydriodate of ethyl, or the bromide of ethyl. For dyspnœa also the following formulæ are recommended:

- R Potass. iod., 0.50 gramme;
Syr. eucalypti, 35.00 grammes;
Infus. theæ nigræ, 115.00 grammes.
Teaspoonful doses every hour.
- R Tinct. lobeliæ, gtt. xv.;
Sodii iodidi, 1.00 grammes;
Infus. arnicæ, 150.00 grammes.

Coffeespoonful every half hour when the cough is violent.

If the efforts at coughing are very violent emetics will relieve the bronchi and the lungs. The following is recommended:

- R Tinct. cannabis ind., gtt. x.;
Tinct. belladonnæ, xii.;
Ammonii benzoati, 0.35 gramme;
Syr. tolutani, 50.00 grammes;
Infus. caffèæ, 100.00 grammes.

Teaspoonful doses every half hour until the spasms cease.

When the pulse is rapid or very feeble and the fever high, digitalis in suitable doses should be given. If the expectoration is too profuse, six or eight pastils of kermes or of ipecac, or both, may be given daily and four of sulphur. Other medicaments may be given in the form of tar-water, sulphur waters, either pure or combined with milk, arsenical waters, and various other tonics. If the difficulty in removing the bronchial secretion is great, in addition to what has already been mentioned one may prescribe the preparations of ergot and the syrup of sulphate of strychnine.

A. F. C.

II.—MEDICINE.

Starr: Tumors of the Brain in Childhood. (*Medical News*, January 12, 1889.)

Since the recent advances in the localization of cerebral functions and the achievements of cerebral surgery, this subject has become of increased interest. Brain tumors occur at all ages, but at least one-third develop before the twentieth year, and the author has collected the reports of three hundred cases between the ages of one and nineteen, comprising all varieties of tumors.

He first considers the varieties. Tubercular tumors were the most frequent, constituting over one-half of all the cases, and were nearly all multiple. Next in point of frequency were glioma and sarcoma, of each about one-tenth. Cystic tumors were also about one-tenth; but hydatid cysts, echinococcus, and cystocercus were more frequently met with in German records than in those of England and America. Carcinoma, glio-sarcoma, and gumma form but a very small proportion. Of the latter there were only two cases.

In making a diagnosis of tubercular tumor, the hereditary history and the presence of tubercular disease elsewhere will materially aid, as a tubercular tumor without other manifestations is very rare; but if there is no probability of tubercular disease being present, the diagnosis as to the kind of tumor becomes extremely difficult. Gumma is so very rare that unless there is a positive history of acquired syphilis, with its various symptoms, that must be excluded. Carcinoma of the brain is usually secondary, and should a tumor be found elsewhere in the body the diagnosis of the cerebral tumor can be made, otherwise not. Cysts in the brain of parasitic origin form slowly, never destroy the brain tissue, but displace it, and rarely give rise to localized symptoms. Hence, if the

symptoms are all general, and not local, such a condition should be suspected, and an investigation made as to exposure to infection, the presence of tape-worm, or hydatid tumor elsewhere. Glioma, sarcoma, and glio-sarcoma cannot be differentiated from each other. Sarcomata in other regions of the body may lead to suspicion as to the kind of tumor in the brain; but such a condition is of rare occurrence. Glioma, however, is usually very vascular, and if such a condition is present, as manifested by variations of intra-cranial pressure, venous congestions of the retina, symptoms of apoplexy, etc., our suspicions should point to glioma; although if the glioma be encapsulated these symptoms will be wanting.

As to the situation of the tumor,—all parts of the brain may be invaded, but in childhood the parts most frequently selected are the cerebral axis and cerebellum. By the cerebral axis is meant that part of the brain which includes the basal ganglia and internal capsule, the corpora quadrigemina and crura cerebri, the pons, and medulla oblongata. Of the tumors collected, one-third were in the cerebral axis. The diagnosis of these tumors lying upon the base of the brain is not difficult, but the point of interest is that they cannot be reached by the surgeon. Tumors of the cerebellum are more common in children than in adults. Their diagnosis is not difficult. The symptoms present themselves rapidly, because the tumor situated beneath the tentorium cerebelli obstructs the venous flow from the venæ Galeni, and the free interchange of fluid between and through the ventricles, so as to produce both general hydrocephalus and a stretching of the dura mater. The location of the headache does not indicate the seat of the disease, but tenderness to percussion over the occiput is a valuable sign. The local symptoms are of great value,—viz., vertigo and cerebellar ataxia. They indicate that the middle lobe of the cerebellum is either the seat of the tumor or is encroached upon by a tumor in the hemispheres. If they occur early in relation to the general symptoms, the tumor began in the middle lobe; if late, after many months of suffering, the tumor started in a hemisphere, and finally reached the middle lobe, producing the local symptoms. To decide which hemisphere, watch the patient while walking: he will stagger away from the side on which the tumor lies; and also the cranial nerve symptoms, as strabismus, deafness, facial anæsthesia, or paresis, etc., appear on the side with the tumor.

All operations on tumors of the cerebellum must be exploratory, since the cerebellum presents but one of its three surfaces, and, as yet, no means have been devised for detecting

whether the tumor is near that surface or not. If seen on the exposed surface the tumor may be removed, care being used not to press the medulla or tear or stretch the pneumogastric. The author reports three such operations, but all died within forty-eight hours from shock. If not found on the surface, an exploratory incision may be made, avoiding the middle lobe and dentate nuclei.

It is useless to attempt operations on multiple tumors.

Tumors of the cortex and centrum ovale can be reached by the surgeon, and should be removed. The operation is done as in the adult. The author gives in detail the histories and necropsies of forty cases of cortical and subcortical tumors; in nineteen of these he claims an operation was indicated which would have been successful in sixteen.

A. F. C.

Gibbes: Diphtheria and its Treatment. (*Therapeutic Gazette*, October 15, 1888.)

The author defines diphtheria as a disease caused by a micro-organism which passes into the stomach with the saliva or food, and thence into the blood, from which it is deposited in the lining of the throat. Here it sets up, by its multiplication, inflammation, which causes the death of the lining membrane and deeper parts, the destroyed parts being called false membranes.

The indications for treatment are: 1. To prevent the multiplication of the organisms. Oleum eucalyptus globulus taken into the body, either in the air or in food, will prevent the further formation of membrane. Secondary paralysis has not followed in any case treated. 2. To prevent the destroyed parts putrefying before they separate from the sound parts beneath them. Oleum eucalyptus globulus fulfils this indication. 3. To subdue the inflammation, in order that the destroyed parts may separate from the living. The warm moisture of a poultice, or living in a warm steam atmosphere greatly assist this operation. 4. To counteract the depressing effects of the micro-organism on the system. Oleum eucalyptus globulus does this effectually, and also prevents the warm, moist atmosphere, when saturated with it, from depressing the patient.

The oil of eucalyptus is contained in the leaves of the tree, and placing them in a jug of boiling water under a tent made over the patient fulfils every indication required for treating the disease. The writer reports but one death in one hundred and forty-five cases as the result of the above treatment. Until he had formulated the above treatment he lost every bad case.

Hope: Some Clinical Features of Diphtheria and the Treatment by Peroxide of Hydrogen. (*Medical Record*, October 13, 1888.)

The writer believes that in the peroxide of hydrogen will be found, if not a specific, at least the most efficient topical agent in destroying the contagious element and limiting the spread of its formation, and at the same time a remedy which may be employed in the most thorough manner without dread of producing any vicious constitutional effect.

In common with all forms of treatment promising particular or specific results, there are apt to be two substantial reasons which would naturally lead to disappointment. The first lies in the fact that improper cases are selected for experiment. In this category are included those when the disease has already passed the boundary of simple pathological conditions, either on account of a special severity of the attack in its incipency, or, what is identical, a vitiated constitution, where secondary symptoms occur at a much earlier stage and tending to a necessarily fatal termination. Another explanation for the uncertain results attending the use of the peroxide lies in the direction of the preparation itself, as also in the manner of its topical application. The usual descriptions allow the diluted strength of from three to seven volumes of distilled water. Inasmuch as the efficacy depends upon the ozonized oxygen in solution, it has seemed desirable to rely on the full strength of the officinal preparation of fifteen volumes, especially when used in the fauces, where any slight irritation from its acidity is not apparent. In all the cases treated, a fresh standard Marchand preparation of fifteen volumes was that on which the experience of the writer has been based. A steady coarse spray, with an air-pressure of twenty pounds or more, will, in a few moments time, produce a more positive action than prolonged efforts to reach the fauces by means of cotton applicators. The force of the spray should be sufficient to cleanse at once the surface accumulations, as it destroys the necrosial elements with which it comes in contact. In this manner the removal of the *débris* and the action on the deeper structures go hand in hand.

It will be noticed that immediately on contact with the peroxide a white, cloudy coagulum is formed on and about the diphtheritic patches, readily floated off, and exposing a more sharply-defined and a flatter, smooth, and whiter base. Properly speaking, there is no liquefaction of the exudation, but the decomposition of the inflammatory products is so complete that the cells are broken up and freed from the entangling fibrous net-work beneath.

How frequently the treatment is to be followed up depends to a considerable extent on the density as well as the area of the surface involved. It may be said, however, that two applications a day, in the great majority of cases, should be sufficient, if thoroughly performed, to arrest all danger of extension, and accomplish the gradual resolution of the local formation.

Scott: Fatal Hemorrhage associated with Jaundice in a Child Seven Days Old. (*The Lancet*, July 28, 1888.)

The infant, a male, seemed healthy and was well developed. On the fourth day the stump of the cord separated, and there occurred a profuse oozing from the umbilicus. The child had no premonitory symptoms except that it was unusually quiet until the morning of that day. Besides the hemorrhage from the umbilicus, there were ecchymosis over the shoulder, spinous processes, ilium, and other places. On the following day the infant was decidedly jaundiced. In spite of treatment, the bleeding from the umbilicus recurred at intervals, the jaundice became more marked, and the child died on the seventh day.

This case is interesting because of the absence of all the usual recognized causes.

The author advances a theory to explain the pathology of this case and the closely allied though harmless affections,—*icterus neonatorum*.

When the placenta is separated from the womb during labor, or when the cord is suddenly tied soon afterwards, the fetal circulation must stop. This condition must lead to the production of a certain amount of passive congestion in the liver. A temporary and very slight slowing of the circulation may be expected. Other and more important changes begin to take place in the infant's circulation, simultaneous with its first inspiration. This transformation is never instantaneously complete, and may probably extend from moments to months in different individuals. So we may safely conclude that in every case for the first few minutes there is a double kind of circulation, partly as in the adult and partly as in the fetus.

This "setting to right" process must give in to a feeble circulation, which will be more marked in parts removed from the heart. This is how the author accounts for the blue, cold extremities observable in infants during the first few hours. The passive congestion of the liver will be mild or severe, long or short, in proportion to the strength of the child and its capacity for inspiration; but in the majority of cases it is severe enough to lead to an excess of biliary coloring matter in the blood, and its appearance in the skin and sclerotic. This

phenomenon we term "icterus neonatorum." As a healthy circulation is established the passive congestion disappears and with it the icterus. In a weakly infant the congestion in the liver will be more marked and prolonged,—a fact which corresponds to the observation of every midwife, that icterus is deeper in puny children than in the robust. The author holds that icterus neonatorum is the result of a pathological process, and that those cases in which an apparently healthy child, without any other known cause, within a few days of birth, is seized with a fatal hemorrhage associated with jaundice are merely instances of exaggerated forms of the same pathological process.

When passive congestion is once developed, if the heart fails, more or less disorganization of the liver substance will occur. Bile and waste products will accumulate in the blood, the delicate walls of the capillaries throughout the body will be impaired, and effusions of blood take place under the skin, mucous membrane, etc., till the child sooner or later dies of exhaustion.

Lingard, Alfred: Notes on the Etiology of Ulcerative Stomatitis. (*The Lancet*, July 28, 1888.)

The disease affects the tongue, cheek, and, secondarily, the lungs, both in the human subject and in animals. Portions of the affected tissues inoculated in calves produced a disease resembling noma in all respects. The essential characters of the micro-organisms in all cases were similar. From inoculations made from diseased tissue from the human beings and from animals it was demonstrated that the inoculated disease is characterized by appearances precisely similar to those seen in the original disease.

In animals, after inoculation with affected tissue, the author has found after death various cardiac changes. The most interesting observation is that there are necrotic areas of tissue in the substance of the heart. Such serious lesions are not found in the human heart, in consequence of the early death of the patient. In five necropsies made on children dying of noma, heart lesion was found only once, and that was characterized by the presence of petechial spots over the surface of the heart. Careful observation shows the presence of organisms, but in no instance was the bacillus nomæ found.

Icterus Neonatorum. (*The Lancet*, June 23, 1888.)

Severe icterus neonatorum is usually observed, according to Kehrer, on the second or third day after birth. Baginsky noted the first discoloration on the face and breast, the abdomen,

extremities, and eyes being affected later. The red corpuscles, which number from six to seven millions per cubic centimetre on the first day of life, are found to number only from four to five millions on the fourth or fifth day.

Hofmeier ascertained that the red corpuscles are more spherical than in the blood of adults; that they show no tendency to form rouleaux; that the white corpuscles are often in greater proportion than in adults' blood, and that they accumulate in rouleaux; that they are viscid, deliquescent, and easily destroyed.

Silberman injected hæmoglobin into the blood of frogs, dogs, and puppies, and found that the changes in the blood, urine, and liver corresponded with those which are seen in new-born infants during the first days of life.

Hofmeier showed that in jaundiced infants, during the first ten days of life, there was a decided loss of weight and a great increase in the elimination of urea, uric acid infarcts, and albumen.

Perls has shown that bile has the power of dissolving the red corpuscles, of depressing the temperature and cardiac action, and of paralyzing the activity of nerve and muscle.

Currier draws a clear distinction between cases of icterus due to excess of hæmoglobin in the blood, those which are due to resorption of the bile, and those which result from septic elements and conditions.

Humphreys: Two Cases of Intussusception. (*Lancet*, October 27, 1888.)

A child, aged two and a half years, was taken suddenly ill, with intermittent abdominal pain and bloody movements. The abdomen on the right side was rigid and dull, and there was a lump to be felt about two inches to the right and one inch below the umbilicus. Later, peristaltic movement was noticed in the abdominal tumor. The diagnosis of intussusception was made, and about eight ounces of warm water injected into the rectum. As the last half-ounce was injected something seemed to move, and, upon examining, the lump had disappeared. Dulness and tenderness at the spot where the tumor had originally been noticed recurred periodically for about a month afterwards. This may have been due to the injury inflicted by the strangulation. The patient made a good recovery.

The second case was an infant, eight and a half months old. The child was taken suddenly ill with vomiting and pain, and a few minutes later had a bloody stool. Vomiting and frequent movements of blood and mucus continued. Examination of the abdomen showed no change apparent to the eye;

to the touch there was resistance under the right rectus midway between the umbilicus and pubes, and dulness on percussion. Nothing was learned under chloroform. In spite of the absence of a tumor, the signs pointed to intussusception. About a pint of warm water was injected into the rectum. The child suddenly stopped crying, and there seemed to be relief from pain. The blood-flow ceased at once. It made a rapid and perfect recovery.

These cases illustrate the ease with which intussusception can be managed if diagnosis is early and treatment prompt. Chloroform was unnecessary in both cases. The injection in each case was made with a syringe, but was done slowly and with slight pressure.

Lees, David B.: Two Cases of Hysteria in Boys. (*The Lancet*, June 9, 1888.)

The first patient was a boy, aged eight years, belonging to a family of strongly-marked neurotic disposition. His symptoms—developed rather suddenly—were constipation, vague complaints of pain which could not be localized, at times inability to walk, a capricious appetite, and sometimes he insisted that he could not swallow. The treatment was mainly moral. A deaf ear was turned to his complaints, and he was kept from his brothers and sisters. The cure was complete.

The second case is of an entirely different type. The symptoms belonged entirely to the sensory sphere. He had severe headache, there were anæsthetic areas, hemianopia, and impaired hearing, all of which were changed in seat from time to time. The boy recovered without special treatment.

These cases are reported at length by the author. The occurrence of such cases in the male sex shows the absurdity of a designation which by its derivation implies the influence of an organ which that sex does not possess.

Infantile Atrophy. (*The Lancet*, June 30, 1888.)

Bohn, following Henoch, defines infantile atrophy as an independent condition of the system, the result of a continuous deficiency in nutrition, the means of a reparation of material being defective. Metabolism may be regarded as excessive or normal, anabolism insufficient. Intestinal catarrh, though not a constant symptom, as maintained by Parrot, is a complication due to external causes. In these infants œdema of the skin or dropsy does not occur. The poverty of the solid tissues and organs of the body is shared by the blood, and no hydræmic state is developed. The cranial bones of atrophied infants during the first year of life are always hard, in marked con-

trast to the cranio-tabes of rachitic children of the same age. Bohn does not consider that the atrophy results from wasting of the intestinal mucous membrane, and the conclusion is that no organic disease at present known can produce the condition.

Money, Angel: Chronic Infantile Sclerema and Paralysis. (*The Lancet*, October 27, 1888.)

The affection is characterized by slowly-developing sclerema, and weakness, ending in death, usually with convulsions, and often affecting many children of the same parents.

The three cases reported died at the age of four and a half, eight, and nine months respectively. In all it began about the same time,—the second month. The three cases were females. The remaining child of the family, a boy, was perfectly healthy at the age of two and a half years.

The children at first became thin. Then there began to develop paralysis of the extremities, usually beginning in the arms, and extending until there was well-marked paralysis of all four limbs. Later the face became paralyzed. A strong faradic current elicited no reaction in the legs, arms, or fore-arms, and only slightly in the face. The skin of the limbs, shoulders, and buttocks gradually got firmer and fatter. A fold or bar developed across the back just above the buttocks in each case. The sclerematous skin did not pit on pressure, and had a bluish-red hue, or this color would develop if manipulated. The mental state was good, and the special senses seemed normal. The bowels acted naturally, and micturition was natural. There was no rise of temperature: pulse from 120 to 144; respiration from 30 to 50 in the later stages. The urine contained no albumen or sugar, and gave only a small percentage of urea. The breathing towards the end of the disease became diaphragmatic, and in one case râles were heard in the chest. The breathing became more and more rapid and difficult. In neither of the children was there any evidence of syphilis.

These cases are not sclerema neonatorum as ordinarily witnessed. The long duration of loss of faradic reaction, the extreme talipes equinus, and the local clonic spasms of the face are not the ordinary symptoms of the last days of sclerema neonatorum.

A condition of skin resembling, in its not pitting, myxosclema, and some forms of scleriosis may be seen in infantile palsy, and in other spinal paralyses.

The lung mischief must probably be regarded as due to the paralysis of the intercostal muscles and diaphragm, together with the soft yielding chest walls.

Prepared sections of the skin showed the infiltration of the cutis with a wax-like deposit and a decided outgrowth of nuclei around the sweat-glands and vessels of the skin.

Philpot, J. H.: Gonorrhœal Rheumatism occurring at the Age of Nine Years. (*The Lancet*, October 6, 1888.)

The occurrence of acute inflammation in the metatarso-cuneiform joint of a girl so young as this patient was difficult of explanation in the absence of a history of injury. It was this that directed attention to a vaginal complication. The patient had suffered from painful micturition and a thick purulent vaginal discharge for a week. Pain developed first in the right occipital tendon, and then extended in order to the left occipital tendon, the inner side of the left heel, along the sole, and finally to the first metatarso-cuneiform joint. The joint was intensely painful and swollen. No other joint was affected while the patient was under observation. The patient was treated for gonorrhœal rheumatism and the foot put up in plaster of Paris splints. She recovered without complications. It was learned that the child had been indecently assaulted by a youth who had recently had gonorrhœa.

Vinay: Prophylaxis and Disinfection in Variola. (*Rev. Mens. des Mal. de l'Enf.*, October, 1888.)

The prophylaxis of variola is well enough known, since it consists in vaccination of the well and isolation of the diseased. With reference to vaccination, no further proof of its utility are necessary; it only remains to enforce its performance. Isolation, to be efficacious, demands a rigid surveillance and sometimes special arrangements. Isolation in a hospital ward is of no practical benefit. Not only should the patient's skin be disinfected, but his clothing and bedclothing and the room in which he has been during his illness.

The nature and morphology of the parasite which causes variola being still unknown, it is impossible to determine the chemical agents which will arrest its development or destroy it. It is supposed that the originating germ has the highest degree of resistance of any of the morbid micro-organisms. It is generally admitted that it is well to disinfect the cutaneous lesions of the disease, for within the pustules are found the germs which are a potent cause of infection for five or six weeks, or until all crusts have disappeared. For the crusts of the face and head ointments with a base of vaseline should be used, sublimate being incorporated of the strength of one to one thousand, or thymol, one to thirty, may be used. Carbolic acid is not very efficient. The hair should be shaved from

the scalp that the ointment may be applied upon it. Warm baths should also be used to detach crusts and scales and diminish inflammation. A bath may be rendered more thoroughly disinfectant by adding two hundred grammes of sulphate of potash to the water. Sublimate in baths would be dangerous in cases in which the skin has been deprived of its epidermis. Potash soap dissolved in water, in the proportion of one to five thousand, will arrest germination of bacilli, and suppress it entirely in the strength of one to one thousand. After the patient has left the bath the water should not be removed from the tub for at least two hours that the soap may have sufficient effect upon the epidermal scales. The baths should have a temperature of 37° C., should be repeated at short intervals, and each should last from three-quarters of an hour to an hour. Each hospital in which variolous patients are treated should have an apparatus for generating steam, by which all clothes and bedclothes of patients can be disinfected, the steam being used under pressure. The sick-rooms may be disinfected by fumigation with sulphurous acid gas, fifteen to twenty grammes of flowers of sulphur being burned for each cubic meter of space in the room. The room should be exposed to these fumes from twelve to forty-eight hours, but Wolfhugel and Koch believe that this method is inconvenient and ineffective. Fischer and Roskauer have also criticised fumigation with chlorine gas as also an inefficient method. Guttman and Merke have recommended the sprinkling or washing of the walls and floors of a room with a disinfectant solution as the most effective way of producing disinfection. This may be done by means of a large atomizer, a solution of sublimate, one to one thousand, being used. After the walls have become completely dry a second atomization, with a one-per-cent. solution of carbonate of soda, should be practised, by which means the insoluble oxychloride of mercury will be formed. The walls may also be rubbed with fresh bread, which must then be burned in accordance with Esmarch's suggestion.

A. F. C.

III.—SURGERY.

Lane, W. Arbuthnot: The Factors that determine Hypertrophy of the Skull in Mollities Ossium, Ostitis Deformans, Rickets, and Hereditary Syphilis. (*The Lancet*, April 28, 1888.)

The position taken by the author is that hypertrophy of the skull in these conditions is mechanical in its causation, being dependent upon and remedial of the softening which precedes

it. It is not the direct effect of the process of disease, but a vigorous effort on the part of the organism to oppose the direct results and limit their deleterious effect. There is first a diminution in the hardness and firmness of the cranial vault, which is then unable to resist as much pressure as the normal skull. The thickening is consequent upon this process, in order that the brain, on account of its extreme importance, may be carefully and completely guarded from injury.

However little the capacity for repair is, in these diseases, it seems to be concentrated upon strengthening and thickening the brain case, apparently at the expense of the osseous system generally. The function of repair is distributed among the portions of the osseous system in proportion to the importance of each.

When a long form has become too weak to transmit superjacent pressure, or has assumed a curved form, new bone is deposited endosteally and periosteally, but especially along the concavity of the curve. This deposit of new bone tends to limit the deformity which would ensue if it were not present. In the case of the softening skull the endosteal deposit first takes place, and, that becoming insufficient to preserve the necessary rigidity and elasticity of the cranial bones, a calcified or decalcified callus is deposited upon the outer convex surface of the vault, the convexity in this case sustaining the strain which is exerted chiefly upon the concavity of the curved long bone.

The variations in the character and the arrangement of the thickening in these several conditions are dependent on factors other than the one alluded to in this paper.

Beaupère: Chloroform and Tracheotomy in Croup. (*Le Concours Méd.*, October 13, 1888.)

The question is raised, whether it is useful to anæsthetize a patient upon whom tracheotomy is to be performed, bearing in mind the condition of more or less pronounced insensitiveness which obtains when tracheotomy for croup is indicated. Brown-Séquard found, by experiments upon dogs and apes, that, after an incision had been made in the anterior portion of the neck, the animals were quite insensitive to pain, and he concludes that insensitiveness, in cases in which tracheotomy is to be performed without an anæsthetic, is not due to asphyxia, but to the fact that at the very beginning of the incision in the skin there is diminution or loss of sensibility from inhibition. With reference to pain, therefore, the patient does not gain much by the use of an anæsthetic. Aside from the question of pain, the lesions of the larynx, the presence in it

of diphtheritic membrane, cause a forcible spasm of the glottis. Anæsthesia overcomes this spasm and enables one to operate quietly and deliberately; it also retards the progress of asphyxia. Another question concerns the danger in the use of anæsthetics when one is about to perform tracheotomy. Brannan, who has operated four hundred times, always operates under anæsthesia, and refused to tracheotomize the late Emperor Frederick, of Germany, unless anæsthesia were induced. The majority of surgeons of large experience believe that no danger attends the administration of anæsthetics previous to tracheotomy, under certain conditions. As to the substance which is most desirable for the production of anæsthesia, amylene and protoxide of nitrogen are not reliable,—only are believed to be of use,—and Beaupère is of opinion that chloroform should be used exclusively, especially in the case of children. Ether is apt to produce irritation of the mucous membrane of the air-passages and induce the spasm of the glottis, which one seeks to avoid. Chloroform acts rapidly, only a small quantity is required, it is unattended with a period of excitation, the tracheal reflex is preserved when the trachea is incised, and no nausea or vomiting attends its use. The conclusions of Panné, in a recent thesis upon tracheotomy, are:

1. Experience has shown that chloroform has great advantages in the performance of tracheotomy, while no real danger is incurred from its use. It should not be used when the patient is profoundly asphyxiated, and when there is bronchopneumonia.

2. By controlling paroxysms of suffocation it enables one to operate with deliberation.

3. The incision should be made with a bistoury, hemorrhage being checked with hæmostatic forceps.

4. Anæsthesia and deliberate operation are especially appropriate in cases in which tracheotomy is rendered difficult on account of anatomical peculiarities in the neck. A. F. C.

Walsham, W. J.: Instrument for the Treatment of Infantile Paralysis involving the Extensor Muscles of the Knee. (*The Lancet*, July 28, 1888.)

The author has devised an arrangement for this class of cases which he believes possesses advantages over the usual way of dealing with them. The apparatus consists of a certain arrangement of levers whereby the muscles moving the hip-joint are made to supply the place of the paralyzed extensors of the leg, and to a certain extent the movements of the hip are made to control the movements of the knee. The

instrument is so contrived that when the hip is either flexed or extended, by means of its flexor or extensor muscles, the knee, by means of the side levers, is also flexed or extended to a like degree. As long as the hip is kept extended the joint at the knee is rendered fixed, and a rigid limb is thus provided for supporting the body. In walking, however, during the pendulum-like movement of the limb as it swings forward, while the opposite limb is on the ground, the knee should not entirely follow the movement of the hip. To allow for this a double stop-joint is further provided at the hip, permitting flexion and extension of the hip to take place to several degrees before the levers which act upon the knee are brought into action. At first it may be necessary, while the hip-muscles are gaining power, to fix the knees completely by means of a screw-nut.

In the original article the wood-cut of the instrument sufficiently explains itself.

Owen: Arthrectomy of the Knee. (*The Lancet*, July 31, 1888.)

This operation is finding more favor in strumous disease of joints as its advantages and the indications for its performance are recognized. Experience shows that, after a thorough arthrectomy, all the tubercular or diseased material having been taken away, the child usually begins to improve in health and appearance as vigorously as it would if it had been freed of the disease by amputation. There are, proportionately, but few cases of tubercular knee-disease which are unfitted for treatment by arthrectomy.

Compared with the old, classical excision, arthrectomy has these manifest advantages,—it aims at the removal of every particle of diseased tissue from the joint, while it interferes with the bones only to the extent of the removal of carious tissue; no osseous tissue, or only the smallest quantity, being removed, the risk of shortening is reduced to a minimum. Permanent stiffness—synostosis—of the joint is, of course, inevitable after an arthrectomy for advanced disease. In slight articular disease, after limited operation, the movement of the joint may be little, if at all, affected. The cases reported in this paper well illustrate the principles and results of this method of treatment.

Stewart: Cerebellar Abscess following Mastoid Disease. (*The Lancet*, August 25, 1888.)

A boy, aged ten, had had a discharge from the right ear three years previously. Under treatment it ceased for a few

months and then began again. At the time of examination there was great pain in the right ear and tenderness and swelling of the meatus. There were redness, tenderness, and swelling over the mastoid, but no fluctuation. It was treated by leeches, then by free incision, and later the mastoid cells were opened. The patient died two weeks from the beginning of treatment. At the autopsy it was found that nearly the whole of the right hemisphere of the cerebellum was occupied by an abscess. In the right lateral sinus there was a small quantity of pus. There was caries of the mastoid and petrous portions of the temporal bone.

Remarks.—Dr. Gowers, in his “Lectures on Diseases of the Brain,” says, “Diseases of the cerebellum away from the middle peduncle cause *per se* no definite symptoms of diagnostic importance. Symptoms depend on compression of the middle lobes.” This case illustrates these facts. The boy was free from pain, took nourishment well, was cheerful, and able to sit up and move about the bed until the morning on which he died, when brain symptoms set in and he rapidly sank. The case shows also the danger of chronic suppurative otitis media, even when the discharge has been to all appearance cured.

Casselberry: A New Method of Feeding in Cases of Intubation of the Larynx by Position, Head Downward, on an Inclined Plane. (*Chicago Med. Jour. and Exam.*, October, 1888.)

The writer has been very successful in preventing the entrance of food into the larynx in cases of intubation by the following method of feeding: The child is held on its back,—at an angle of from 45° to 90° ,—in the arms of the nurse, the legs elevated, and the head left to hang over the arm. Then it may take the mouth of the feeding-bottle, suck through a tube from a glass, or feed from a spoon. The only difficulty is encountered when the child is again placed in the upright position, which posture it must not be permitted to regain until it has been made to swallow three or four times after the vessel of liquid has been taken from its mouth, in order to swallow all the fluid which has gravitated into the pharynx and naso-pharynx. After they have learned this they will readily swallow several times, so as to force the liquid remaining in the throat into the stomach before the upright position is again taken, and then there is no trouble. The patient can be inclined without inconvenience for a minute or more, although much less than this only is necessary.

There is no danger of the tube slipping out unless one of

too small size has been inserted, when it would become a fortunate accident, permitting the selection of a proper size for reintroduction.

Hubbard: Some Suggestions concerning the Prevention of Chronic Joint-Disease in Children. (*Med. Rec.*, November 10, 1888.)

After briefly discussing the different modern views in regard to the pathology and etiology of chronic joint lesions, the writer offers the following suggestions for their prevention:

1. A careful inquiry by the surgeon into the hereditary history of each family which he may have charge of; and if a well-marked history of hereditary disease, especially tuberculosis, is found, a warning should be given to the parents of the dangers to which the children are exposed.

2. Instruction in regard to hygiene, diet, etc., with the endeavor to keep the nutrition of the children up to the highest point until they have passed the period at which they are most liable to contract a joint lesion,—viz., the period of puberty.

3. When tuberculosis is present in a family, either as phthisis pulmonalis or a joint lesion with an abscess, all sputa or discharges should be destroyed or disinfected; and healthy children should be brought as little as possible in contact with the sick. In this way the risk of a direct contagion may be reduced to a minimum.

4. Instruction should be given in regard to the importance of any traumatism of a joint or the parts near it, however slight it may be. After such an injury absolute rest of the joint should be insisted upon until all evidence of inflammation has subsided and the function of the part is perfectly restored.

5. The prohibition of all sports or exercises which bring repeated traumatism upon one joint. Young children should not be allowed to go up and down stairs frequently.

6. After one of the acute exanthematous fevers a considerable period should elapse before active exercise, such as running, jumping, or long walks, is allowed.

Tubby, A. H: A New Method of Extension in Hip-Joint Disease. (*The Lancet*, August 18, 1888.)

The objects aimed at in applying extension in disease of the hip-joint are: first complete rest of the affected part, not only freedom from movement but also muscular spasm; and, secondly, when the inflammation subsides, to insure as little resulting deformity of the spine, pelvis, and limb as

possible. If, in the stage of abduction and flexion, weight be applied so as to bring the thigh in contact with the bed, the tension of the anterior muscles and anterior ligaments of the inflamed joint is increased, and the diseased surfaces are brought in closer contact.

Mr. Howard Morsh's plan is to raise the limb until all lordosis has disappeared, and then to place it on an inclined plane, the angle of which corresponds with that of the thigh, and then to apply weight extension.

Professor von Volkmann's plan in the stage of abduction is to apply a weight to both legs, but the *heavier* weight is on the *sound* side. This gives extension on the diseased side. It tends also to render the pelvis horizontal, and acting lever-like with the lumbo-sacral articulation as a fulcrum, not only corrects the tilting, but also separates more thoroughly the diseased surfaces.

The author suggests a plan which is a combination of the two methods,—viz., to place the affected part on an inclined plane of such an angle that the lumbar spine is in complete contact with the bed, and then to apply a weight to each limb; but that on the sound side should be three or four pounds heavier than that on the diseased side.

Weights can be readily extemporized from calico bags filled with shot.

Steele, Charles: Case of Deficient Œsophagus. (*The Lancet*, October 20, 1888.)

This case is of interest both from a surgical and anatomical point of view. It was discovered that there was something wrong with the œsophagus when the infant was given nourishment. It took the food readily, but soon became livid, had difficulty in breathing, and then returned the food and appeared no worse. A sound was introduced, and it was found that, after passing about five inches, it encountered an impassable obstruction. It was diagnosticated that there was either a membrane across the œsophagus, or that it ended in blind terminations. It was advised that the stomach be opened and the œsophagus be explored, so that if a membrane across a continuous canal could be made out it might be perforated.

On the following day the stomach was exposed in the middle line of the abdomen, above the umbilicus, stitched to the skin, and then opened. A bougie was passed down the œsophagus, as before, and another upward from the stomach; but they did not approach by what was judged to be an inch and a half. A gum-elastic catheter was then cut in half and

passed from below. A slender steel probe was introduced in it and pressed upward as much as was justifiable in case the lower part of the tube might be twisted or narrowed, and capable of being rendered pervious. All was of no avail, however; so the stomach wound was closed with sutures, also the abdominal wound. The infant died in twenty-four hours. At the necropsy it was found that the œsophagus terminated above and below in blind, rounded ends, an inch and a half apart. All the wounded parts were quite healthy, and the appearances led to the conclusion that had there been only a membranous occlusion a happy result might well have been hoped for.

Murray: Perforative Peritonitis caused by *Ascarides Lumbricoides*. (*The Lancet*, September 1, 1888.)

This paper reports three cases. They all had symptoms of peritonitis. Post-mortem examination showed perforation of the intestine and round worms in the peritoneal cavity. The perforation was not the result of ulcerative disease in at least one of the cases. In this case the mucous membrane of the alimentary canal was throughout healthy, and presented no trace of tubercular or other disease. In this case, then, death was undoubtedly caused by the worm perforating the bowel.

It is questioned by writers whether the round worm can perforate the intestine. It is generally held that, when found in the peritoneal cavity, it has simply passed thither through an accidental opening. As a result of the author's own observation in Calcutta, he has no doubt whatever that the round worm is capable of causing perforation of the bowel, and actually boring its way into the peritoneum.

Bibliography.

INTUBATION OF THE LARYNX. By F. E. WAREHAM, M.D., Professor of Otology, Rhinology, and Laryngology, College of Physicians and Surgeons of Chicago; Clinical Professor of Laryngology and Rhinology, Chicago Ophthalmic College. 8vo, pp. 110, forty-five wood-cuts. Charles Truax, Chicago, Illinois, 1888.

It is pleasant to say of a book that it meets a demand. The volume under consideration is the first upon the subject that has ever found its way to the consulting library of the practitioner. Its aim is "to give all the information possible upon the subject of Intubation."

Chapter I. gives a history of the early attempts of Bouchut, of Paris, to relieve laryngeal stenosis by means of short, thimble-shaped tubes and of O'Dwyer's independent experiments with the bivalve speculum, the short elliptical, the long elliptical tubes as now used, and of the metal-epiglottis attachment devised by the author.

Chapter II. gives the anatomy of the larynx (illustrated by several wood-cuts), in so far as it concerns intubation.

Chapter III.—“Directions for performing Intubation.” Here the author has been of great service to the beginner,—and to the more experienced as well. Every detail in the operation has been described and pictured till it seems as though nothing further could be desired. The precautions advised to preserve the operator from infection are well put and are practicable.

The author gives very excellent advice as to one step in inserting the instrument. He directs that “the tube should pass *under* the tip of the finger, not over it or by the side of it, but *directly under it*.” The palmar surface of the terminal phalanx of the finger affords a much more sensitive guide than the lateral, and, besides, does not so much tend to crowd the tube to sides of the pharynx.

In the chapter on “After-Treatment” the author does not express any confidence in the internal use of bichloride, though he has tried it faithfully. He advises the local use of bichloride with alcohol (gr. i.— $\bar{3}$ iv.) applied with a hand atomizer.

One chapter gives histories of one hundred and fifty cases in his own experience and a tabular account of one hundred cases reported by Dr. O'Dwyer. The author has met with one case of bronchocele, causing tracheal stenosis, which he endeavored to intubate and found the ordinary tube too short. To meet such cases in future he has added to his own case of instruments a long tube, which he believes will be efficient.

The last chapter is devoted to a brief comparison of the valves of intubation and tracheotomy in pseudo-membranous laryngitis. The most favorable figures for recoveries after tracheotomy he quotes from Bourdillat,—26.40 per cent. for all ages.

In 1072 cases of intubation in various parts of the United States he found 26.77 per cent. of recoveries.

The book is well constructed, profusely illustrated with wood-cuts, and fills its requirements satisfactorily. The likeness of the author is easily recognized among the lay figures engaged in the operation.

W. P. N.

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Original Communications.

THERAPEUTICS OF INFANCY AND CHILDHOOD.

BY A. JACOBI, M.D.,

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(Continued from March Number.)

V.—INFECTIOUS DISEASES.

THE *local treatment* of the pseudo-membranes of the fauces is a subject of great importance. To look upon them as an excretion which needs no interference, is incorrect. If it were possible to remove or destroy them, it would be a great comfort; but they can be reached only in certain places, and just in those in which they do least harm. Pseudo-membranes on the tonsils are the least dangerous, for their lymph communication with the rest of the body is very scanty. Thus almost all forms of tonsillar diphtheria are among the most benign, at least as long as the process does not extend. Most cases of the kind run their mild course in from five to seven days, and it is just these which have given rise to the many proposals of tearing, scratching, cauterizing, swabbing, brushing, and burning. There are cases which do not show the harm done. The fact is, that neither the galvano-cautery nor carbolic acid, nor tannin and glycerin, nor perchloride or subsulphate of iron can

be applied with leisure and accuracy to the very membrane alone, except in the cases of very docile and very patient children. In almost every case the surrounding epithelium is getting scratched off or injured, and thus the diphtheritic deposit will spread. Besides, the membrane of the tonsil is altered surface tissue (as it always is wherever the epithelium is pavement), and not deposited upon the mucous membranes, from which it might be easily detached. Whatever is done must be accomplished without violence of any kind. If nasal injections be found advisable, they can be made so as to wash the posterior pharynx and the tonsils sufficiently, and thus render the special treatment directed to the throat exclusively, useless. Besides, it is easier, meets with less objection, and gives rise to less exhaustion than the forcible opening of the mouth. This fact is of great importance, as I shall show in connection with the local treatment of the nasal cavity. Where it is possible to make local applications without difficulty, the membrane may be brushed with tincture of iodine several times daily, or a drop of rather concentrated carbolic acid. Of powders I know only one, the application of which is not contraindicated, —viz., calomel. Even this may irritate by its very form. Everything dry irritates and gives rise to cough or discomfort. Whatever has, besides, a bad taste or odor, such as sulphur, iodoform, or quinia, must be abhorred. But lately sugar has been recommended as a panacea, also table salt. Iodol will do better than either.

For the purpose of dissolving membranes papayotin, or papaïn, has been employed. It is soluble in twenty parts of water, and may be injected, sprayed, or brushed on. I have used it in greater concentration, in two or four parts of water and glycerin, in the nose, throat, and through the tracheotomy tube, in the trachea. One of the irrepressible drug manufacturers and advertisers pushes the claims of some modification of the drug, which he calls papoid. For the same purpose trypsin is preferred by others. The mode of its application appears to be the reverse of indifferent. But lately I have seen, in the practice of one of our best-known practitioners, papayotin applied in powder, which resulted in constant irritation of the throat, while the patient otherwise was con-

valescent. The pharyngeal hyperæmia and slight exudation disappeared when mild alum washes were substituted.

Diphtheria of the *nose* is apt to terminate fatally unless energetic local treatment is commenced at once. This consists in persevering disinfection and cleansing of the mucous surface. The disinfecting procedure must not be omitted long, because general sepsis results from rapid absorption through the surface, which is supplied with lymph-ducts and small superficial blood-vessels to an unusual extent. Disinfectant injections must be continued every hour, for one or more days. If they be well made, the consecutive adenitis, particularly that about the angles of the lower jaw, is soon relieved, and the general condition improved. But there are cases in which it is not the lymph bodies that are the main gates through which constitutional poisoning takes place, but the blood-vessels only. In the incipient stage of such cases the discharge from the nostrils is more or less sanguineous; in them the blood-vessels, thin and fragile, carry the poison inward with great rapidity.

In a few cases injections are unsuccessful. They are those in which the whole nasal cavity is filled with membranous deposits to such an extent as to require forcible removal. Sometimes it is difficult to push a silver probe through them. That procedure may be repeated, the probe dipped in carbolic acid, or wrapped in absorbent cotton moistened with carbolic acid of fifty or ninety per cent. After a while injections alone will suffice. But now and then the development of pseudo-membranes is very rapid, a few hours suffice to block the nostrils again, and the difficulty is the same.

The liquids which are to be injected must be warm and fairly mild. Solutions of chloride of sodium, two-thirds of one per cent., saturated solutions of boric acid, one part of bichloride of mercury, thirty-five of chloride of sodium, and five thousand of water, more or less, or lime-water, or solutions of papayotin, or a five-per-cent. solution of hyperoxide of hydrogen, or a solution of hyposulphite of sodium, will be found satisfactory. From the selection of these remedies it is at once apparent that the object in view is partly that of washing out and dissolving, and partly of disinfecting. I have not

mentioned carbolic acid, which may be used in solutions of one per cent. or less. Its employment requires care, for much of the injected fluid is swallowed, and proves a danger to children of any age, but mostly to the young. In a number of cases the brushing of the whole surface with oil of turpentine has been found to answer.

Most of the syringes I find in my rounds are abominations. The nozzle must be large, blunt, and soft. After having recommended for many years the common hard-rubber ear-syringe, the sharp end of which was cut off, I now use always a short stout glass syringe with soft-rubber mounting in front.

When the children cannot, or must not, be raised, I employ the same solutions from a spoon, or a plain Davidson atomizer. These applications can thus be made while the children are lying down, every hour or very much oftener, without any or much annoyance. The nozzle must be large, so as to fit the nostril. A single spray on each side will generally suffice. I am in the habit of covering the common nozzle with a short piece of india-rubber tubing.

For a day or two these injections of fluids or spray must be made hourly. It is not cruel to wake the children out of their septic drowsiness; for it is certain death not to do so.

Injections of the nose are oftener ordered than judiciously made. Hundreds of times have I been assured that they had been made regularly, hourly, for days in succession. Still there was a steady increase of glandular swelling and sepsis. I never believe a nurse to have made them regularly unless I have seen her doing it. They *will* run up their syringe vertically and not horizontally; the fluid *will* return through the same nostril. On the successful injecting or spraying of the nares hangs every life in a case of nasal diphtheria. I have long learned to look upon a neglect to tell at every visit how to make an injection, as a dereliction of duty. This may appear a trifling way, but it is a safe one. The nurse must be made to tell you that at every injection the fluid returns through the other nostril, or through the mouth, or is swallowed.

The procedure is simple enough, and need not take more than half a minute for both nostrils. A towel is thrown over

the child's chest up to the chin, and the child gently raised in bed by the person who is to make the injection. This person, sitting on the bed, steadies the patient's head against her chest, while somebody else holds the patient's hands. The syringe is introduced horizontally by the person sitting behind the patient, and gently emptied. No time must be lost in refilling and attending to the other side. When pain is complained of in the ears, more gentleness is required, or the spray, or pouring in from a spoon, or minim-dropper even, has to take the place of the injection.

Many sins are committed in doing this very simple thing. The unfortunate little one is made to see all the preparations, and is worried and excited, and the necessary gentleness in the proceedings is neglected in too many cases.

For the purpose of softening and macerating pseudo-membranes steam has been utilized extensively. Its inhalation is useful in catarrh of the mucous membranes, and in many inflammatory and diphtheritic affections. On mucous membranes it will increase the secretion and liquefy it, and thus aid in the throwing off of the pseudo-membranes. Its action is the more pronounced the greater the amount of muciparous follicles under or alongside a cylindrical or fimbriated epithelium. Thus it is that tracheo-bronchial diphtheria, so-called fibrinous bronchitis, is greatly benefited by it. Children affected with it I have kept in small bath-rooms for days, turning on the hot water, and obliging the patient constantly to breathe the hot clouds. Several such cases I have seen recover with that treatment. Atomized *cold* water will never yield the same result. Nor have I seen the patent inhalers do much good.

Still, where the surface epithelium is pavement rather than cylindrical, and but few muciparous follicles are present, and the pseudo-membrane is rather immersed in, and firmly coherent with, the surface,—for instance, on the tonsils and the vocal cords,—the steam treatment is less appropriate. On the contrary, moist heat is liable in such cases to favor the extension of the process by softening the hitherto healthy mucous membrane. Thus it takes all the tact of the practitioner to select the proper cases for the administration of steam, not to

speak of the judgment which is required to determine to what extent the expulsion of air from the steam-moistened room or tent is permissible.

Steam can be properly mixed with medicinal vapors. In the room of the patient water is kept boiling constantly over the fireplace, provided the steam is prevented from escaping directly into the chimney, on a stove (the modern self-feeders are insufficient for that purpose and abominations for every reason); over an alcohol-lamp, if we cannot do better; not on gas, if possible, because of the large amount of oxygen which it consumes. Every hour a tablespoonful of oil of turpentine, and perhaps also a teaspoonful of carbolic acid, is poured on the water and evaporated. The air of the room is filled with steam and vapors, and thus the contact with the sore surfaces and the respiratory tract is obtained with absolute certainty.

The secretion of the mucous membranes is sometimes quite abundant under the influence of steam, but still more, like that of the external integuments, increased by the introduction of water into the circulation. Therefore, drinking of large quantities of water, or water mixed with an alcoholic stimulant, must be encouraged. Over a thoroughly moistened mucous membrane the pseudo-membrane is more easily made to float and macerate.

To evolve large volumes of steam the slaking of lime has been resorted to. It is both an old and effective procedure. Not only is the object in view accomplished by it, but it is the best means of bringing lime into contact with the morbid surface. In a room in which lime has been slaked, everything is getting covered with it. Thus this method of profiting by the local effect of lime is decidedly preferable to the almost nugatory effect of lime-water.

It was to fulfil the same indication of softening the pseudo-membrane, by increasing the secretion of the mucous membranes, that pilocarpine or jaborandi was highly recommended. Guttman recommended it as a panacea in all forms of diphtheria. There is no doubt that the secretion of the mucous membrane is vastly increased by its internal application, and by repeated subcutaneous injections of the muriate or nitrate of the alkaloid, but the heart is enfeebled by its use. I have seen but

few cases in which I could continue the treatment for a sufficient time. In many I had to stop it because after some days of persistent administration I feared for the safety of the patients. Therefore, as early as the meeting of the American Medical Association at Richmond, eight years ago, I felt obliged to warn against its indiscriminate use in diphtheria. Thus it has shared the fate of all the hundreds of remedies and methods which have been declared to be infallible, and found wanting.

Diphtheritic *adenitis*, the swelling of the cervical glands near the angles of the lower jaw, to which I have alluded as an ominous symptom, points to nasal and naso-pharyngeal infection. The treatment consists in disinfection of the absorbing surfaces.

Direct local treatment of the glands, if not entirely useless, is, at all events, of minor importance and efficiency. The application of an ice-bag of moderate size will render the best service. The use of one part of carbolic acid to ten of alcohol irritates both surface and patient more than they can do good. Inunctions may do some good by friction (massage); inunctions with some absorbable material in them may do a little better. The common iodide of potassium ointment is useless; iodide of potassium in three or five parts of glycerin is more readily absorbed; the same in equal parts of water, with a little animal fat, and six or eight times its quantity of lanolin, gives an ointment which is so readily absorbed that iodine is found in the urine within a few hours. Iodoform may be utilized in the same way. Injections of iodoform in ether, which I suggested some time ago, are too painful. Mercurial inunctions, those of blue ointment, require too much time for any effect to take place. Oleates are too irritating locally; a lanolin ointment would prove more satisfactory. After all, however, the readiest method of reducing the swelling of the glands, and improving the prognosis accordingly, is that of cleansing and disinfecting the field of absorption. The rare cases of suppuration in these glands require incision and disinfection. They are as ominous as they are rare, however. There is but little pus, as a rule, but one or many local deposits of disintegrated gland-cells and gangrenous connective tissue. The incisions must be extensive, the scoop and concentrated carbolic acid must be freely

used. In these cases hemorrhages may occur, some of them very difficult to manage. I have seen some of them terminate fatally. In these carbolic acid must be avoided. Compression, actual cautery, and acupressure have rendered good service. Solutions of iron must be avoided, for the scurf formed is a shield, behind which deleterious absorption is going on constantly in such wounds, as it does in the uterus.

The *internal treatment* of an average case of pharyngeal diphtheria can be made to combine the indications of both internal and local administration. Of a two-per-cent. solution of the hyperoxide of hydrogen, or a five-per-cent. solution of the hypsulphite of sodium, a teaspoonful may be given every two hours. Both of these remedies have been extolled. It is their misfortune that they have been praised as panaceas. For thirty years I have preferred the use of the tincture of the chloride of iron. It is an astringent and antiseptic. Its contact with the diseased surface is as important as is its general effect; therefore it must be given frequently, in hourly or half-hourly doses, even, every twenty or fifteen minutes. An infant of a year may take three or four grammes (one drachm) a day, a child of three or five years eight or twelve grammes (two or three drachms). It must be mixed with water to such an extent that the dose is half a teaspoonful or a teaspoonful; a drachm, or two drachms, with a small quantity of chlorate of potassium, in four ounces, allows half a teaspoonful every twenty minutes. No water must be drunk after the medicine. As a rule, it is well tolerated. There are some, however, who will not bear it well. Vomiting or diarrhœa is a contraindication to persevering in its use, for nothing must be allowed to occur which reduces strength and vigor. A good adjuvant is glycerin, a better one than syrups. From ten to fifteen per cent. of the mixture may consist of it. Now and then, but rarely, it is not well tolerated neither. When diarrhœa sets in glycerin must be discontinued. Still, these cases are rare; indeed, the stomach bears glycerin very much better than the rectum.

In connection with this remedy, I wish to make a remark of decidedly practical importance. I know quite well that recovery does not always prove the efficacy of the remedy or remedies administered. But I have seen so many bad cases

recover with chloride of iron, when treated after the method detailed above, that I cannot rescind former expressions of my belief in its value. Still, I have often been so situated that I had to give it up in peculiar cases. These are such in which the main symptoms are those of intense sepsis, I should say such in which the iron and other rational treatment was not powerful enough to prevent the rapid progress of the disease. Children with naso-pharyngeal diphtheria, large glandular swelling, feeble heart, and frequent pulse, thorough sepsis, and irritable stomach besides, those in which large doses only of stimulants, general and cardiac, can possibly promise any relief, are better off without the iron. When the circumstances are such as to leave the choice between iron and alcohol, it is best to omit the iron and rely on stimulants mostly. The quantities required are so great that the absorbent powers of the stomach are no longer sufficient for both.

Nor is iron sufficient or safe in those cases which are pre-eminently laryngeal. To rely on iron in membranous croup means waste and danger.

In this latter form of membranous croup, diphtheritic laryngitis, or laryngeal diphtheria, the most useful internal remedy is mercury. Empiricism has often praised calomel in small and large doses. My acquaintance with mercury in this connection is not at all new. Five years ago I published (*Med. Record*, May 24, 1884) a number of cases which got well under its use; at the same time that Dr. Thallon, of Brooklyn, published an article on the same subject. Since I have employed it (I prefer the bichloride), my conviction of the utter uselessness of internal medication in laryngeal diphtheria, so-called pseudo-membranous croup, is thoroughly shaken. Until about six years ago I felt certain of a mortality of ninety or ninety-five per cent. of all the cases not operated upon. These figures were not taken from small numbers, for I compared those of others with my own. The latter are not a few neither; for within the last thirty years I have tracheotomized nearly six hundred times, have assisted at as many more operations, and have seen at least one thousand cases of laryngeal diphtheria which were not operated upon at all. During the last six years I have seen no less than two hundred cases, perhaps many more.

Among them recoveries have not been rare at all, at all ages, from four months upward. The uniform internal medication consisted in the administration of a dose of the bichloride every hour. The smallest daily dose ever given by me in the beginning was fifteen milligrammes, one-fourth of a grain, to a baby of four months; this was continued a few days, and the dose then somewhat diminished. Half a grain daily may be given to children of from three to five years, for four or eight days or longer. The doses vary from one-sixtieth to one-thirtieth. They require a dilution of one in six thousand or ten thousand of water or milk. There is no stomatitis, gastric or intestinal irritation is very rare. It occurred in a few cases, but then it was found that the dilution had not been sufficient, one in two thousand or three thousand only. If ever it exist, small doses of opium will remedy it.

The benefit to be derived from the remedy depends greatly upon the time of its administration. Tracheotomy or intubation is required, as a rule, after days only, and can often be avoided if mercury be given in time. If the operation becomes necessary after all, the treatment must be continued diligently. Never have I seen so many cases of tracheotomy getting well, since 1863, as when the bichloride was being used constantly in 1882 and the seven subsequent years. Nor am I alone with these favorable results. There are dozens of practitioners in New York City with whose methods and results I am well acquainted, some of whom are connected with me, in some capacity or other, who confirm the above statements.

My experience with the bichloride is mainly gathered in cases of laryngeal and bronchial diphtheria, so called pseudomembranous croup and fibrinous bronchitis; it is there where it has been particularly effective. Still, but few of these were quite localized affections. Our cases of diphtheritic laryngitis are mostly descending, and complicated with either diphtheritic pharyngitis, rhinitis, or both. Not a few, mainly of the latter kind, exhibit constitutional symptoms of sepsis. Many such have also recovered.

In any case of diphtheria there may occur conditions and complications which yield their own indications, and require the closest attention on the part of the practitioner. I need

not here refer again to the frequent attacks of exhaustion and heart-failure, which carry off a multitude of patients, unless they be met in time. What I said in previous papers on heart-failure and its prevention (or treatment) holds good in diphtheria, if anywhere. Therapeutical nihilism destroys as many lives as any number of direct mistakes in dosing.

Nephritis and pneumonia are frequent complications or consequences of diphtheria. The treatment of either of them requires no particular recognition in this place. Nor does œdema of the glottis yield indications differing from that occurring from other causes. Diphtheria of the skin and sexual organs requires disinfectant ointments. I have mostly relied on iodoform one part, in from eight to twelve of fat.

Diphtheritic paralysis, though of various anatomical and histological origin, yields in all cases a certain number of identical therapeutical indications. These are: the sustaining of the strength of the heart by digitalis and other cardiac tonics. A child of three years may take daily, for a month, three grains or its equivalent; for instance, one grain of the extract. This is an indication on which I cannot dwell too much. Many of the acute, and most of the chronic, diseases of all ages do very much better by adding to other medications a regular dose of a cardiac tonic. It is true that it is a good practice to follow the golden rule to prescribe simply, and, if possible, a single remedy only, but a better one to prescribe efficiently.

Besides, there are some more indications: mild preparations of iron, provided the digestive organs are not interfered with. Strychnia, or other preparations of nux, at all events. In ordinary cases a child of three years will take an eightieth of a grain three or four times a day. Local friction, massage of the throat, of the extremities, and trunk, dry or with hot water or oil, or water and alcohol; and the use of both the interrupted and continuous currents, according to the known rules, and the locality of the suffering parts, find their ready indications. The paralysis of the respiratory muscles is quite dangerous; the apnoea resulting from it may prove fatal in a short time. In such cases the electrical current used for very short periods, but very frequently, and hypodermic injections of sulphate of strychnia in more than text-book doses, and frequently

repeated, will render good service. I remember a case in which these, and the occasional use of an interrupted current, and occasional artificial respiration by Silvester's method, persevered in for the better part of three days, proved effective.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from March Number.)

IV.—STOMATITIS ULCEROSA.

Pathological anatomy.—Bohn was the first to call attention to the fact that in this disease we are dealing with a process which Virchow calls necrobiosis. It is not necrosis, because, as Virchow states, the conception of the necrotic process implies more or less retention of the external form of the organ or tissue involved. In the necrobiotic process we have to deal with a process which usually ends in softening, and in which there is molecular or cellular necrosis, so that the tissue becomes more fluid in its consistency and more movable. (See Virchow, "Die Cellular Pathologie," p. 402, 1871.) If we examine the products of stomatitis under the microscope, we find very few evidences of the cells of the invaded tissues, but a molecular detritus mixed with lower forms of life, and here and there pus-cells. The process does not respect any part of the mucous membrane upon which it may be located, so that, while it begins upon the surface, the deeper structures of the gums, including the periosteum, are not infrequently invaded. When the process is most intensely developed, necrosis of bone is the result. I have in my possession the alveolar process of the lower jaw containing the four incisors which had to be taken away from a child affected with stomatitis ulcerosa. At times the pro-

cess produces a complete loosening of the teeth, and when these are extracted the disease becomes tractable. At other times the periosteum is more extensively affected, and small sequestra are separated; again, the pathological change is so extensive as to involve one whole division of the bone. In all the specimens, however, that I have been able to examine, there was no caries of the bone; as if the stomatitis had been unable to attack osseous tissue. The necrosis was evidently due to a stripping up of the periosteum, and as the alveolar process is not attached to the jaw with any great amount of firmness, being, as Hunter expresses it, "a part of the teeth," its detachment without caries could be readily explained as far as its lower border was concerned. Laterally, however, as far as the researches in embryology teach us, the detachment must have been the result of an ulcerative process, therefore caries.

The affection always begins upon the gums and in a specific locality,—at the free border. Thence it extends, as has been stated above, in all directions, causing the destruction peculiar to it. But the parts which lie in apposition to those primarily affected are apt to become infected, yet in such a manner that the process never extends beyond the buccal cavity.

Symptomatology.—Stomatitis ulcerosa begins with swelling, injection, and loosening of the mucous membrane about the teeth. At first the swelling will be observed only at the lower part of each tooth, so that the outline of the gum is altered, but not very much. Gradually the swelling increases and the mucous membrane begins to cover the lower portion of the tooth, so that the outline, instead of being curved, becomes almost straight. In the beginning the gums are affected only in so far as they form a covering for the teeth, leaving the spaces between the teeth unaltered. These spaces represent the hills of the natural curved outline of the gum, the mucous membrane covering the teeth representing the valleys. As the latter swell up, they come to a level with the elevations, producing an appearance almost pathognomonic for stomatitis ulcerosa. The swelling may be so great as to produce a slight eversion of the part affected, and is always accompanied by injection, which gives to the mucous membrane a livid appear-

ance. The overfilling of blood is so great that, as a rule, bleeding takes place, frequently produced by the slightest movement of the jaw, or by pressure, such as is produced by touching the gums during the act of examination by the physician. As a rule, the disease is confined to the anterior aspect of the gums, but when certain symptoms are present the careful physician will examine the posterior aspect as well. The rule certainly is, that the disease begins upon the anterior aspect; that there are exceptions is more than probable. In bad cases, however, both anterior and posterior portions of the gum become the seat of the disease. Very soon, accompanying the eversion, the gums are detached from the teeth, and sometimes before the process develops further they can be pulled away from the teeth with very little force, leaving exposed a cavity, which is filled with a peculiar muco-purulent secretion.

Even at this stage the yellowish seam at the top of the swollen outline of the gum may be perceptible. This is due to the molecular destruction which has already begun, and its presence makes diagnosis easy. The yellowish seam is at first very narrow; it may grow to a broad band, involving almost the whole of the gum.

Accompanying these symptoms the patient has a great deal of saliva pouring from his mouth. There is no disease in which salivation is so great as in stomatitis ulcerosa, and, in my experience, it is the most constant symptom. It also gives us an index to the completeness of our cure, and no case should be discharged until the moisture in the mouth is normal. Another symptom is the fetid odor of the breath and of the mouth; this arises directly from the diseased surface, not from the saliva. When the latter is collected, and great quantities can be easily obtained, it will be found, in the majority of cases, to be odorless. Only in very bad cases, such as will be described, does the saliva also have a penetrating fetid odor. Curiously enough, this disease produces few general symptoms, and, especially in older children, little is complained of by the patient. Frequently the patient is brought to the physician on account of the fetid odor or on account of the salivation. In infants the subjective signs are usually better pronounced. The child becomes fretful, cries a great deal, refuses to eat, has

slight elevation of temperature, sleeps badly, and very soon begins to lose flesh. I have seen symptoms produced in this class of patients which would lead to the assumption of a much more serious affection. In several cases the whole disposition of the child seemed changed; instead of a good-natured, healthy, and contented baby, there was a fretful child, crying all the time, and a look of distress and fatigue on its face which seemed to bode evil developments. One patient cried for days from pain, almost incessantly through the twenty-four hours, only dropping off to sleep from sheer fatigue. By proper treatment the whole clinical picture cleared up in a very short space of time. Parents who have once seen an attack of stomatitis ulcerosa are quick to recognize a repetition, and, having seen the good effects of remedies, are just as quick to apply them.

The lymphatic glands take part, and swell up; they are usually soft, and remain swollen until the process has come to an end. Frequently these glands continue to be enlarged long after the disease has run its course; rarely do they take active part so as to be inflamed, although the suppuration of the glands under the maxilla may occur.

In the various conditions described the disease is readily conquered without any active interference except the administration of remedies. When this condition is overlooked a further development usually takes place. Although a subacute or chronic form must be recognized, in which these symptoms last for an almost indefinite length of time, yet such cases are exceptions. In the further development of the disease the essential feature is the coming to the foreground of the necrobiotic process and the production of ulcers.

If we now examine the mouth we find the yellowish, soft seam mentioned before increased in size and resting upon an ulcerated surface. When the yellow material is removed with cotton there is beneath it denuded membrane, swollen and bleeding readily, whose boundary, in its turn, is marked by injection even greater than the rest of the mucous membrane. Upon this denuded surface there is a goodly quantity of pus, but the yellowish material is very adherent to the ulcerated surface. The pus may be formed in sufficient quantity to pour down between the gum and teeth, so that when pressure

is applied quite an amount may be forced up, considering the size of the affected portion. With these various changes the gum is becoming more and more detached from the teeth, so that the latter may become loosened. The process, if left to itself, continues in the same manner, the seam becoming a broad band, the ulcers going deeper, until, finally, the whole tooth is denuded. Necrosis of the bone now takes place, in either one of the ways described before. When a large portion of bone has become necrotic we look in upon a comparatively extensively ulcerated surface presenting the characteristics above mentioned. In every bad case the possibility of necrosis must be borne in mind, and the examination is not to be considered complete until the presence or absence of dead bone has been established: Infection of other parts of the mucous membrane of the mouth also takes place after the ulcers have developed. Infection follows as the result of direct contact, and in the majority of cases affects the lower lip, then the cheeks, the tongue, and the upper lip. These ulcers are the same in every respect as those formed upon the gums; they begin with injection, then comes the formation of detritus with ulceration, the latter having the peculiar tendencies described before, of which the principal one is that the process does not respect the character of tissue upon which it happens to develop. In this state the lymphatic glands are still more enlarged and frequently very tender upon pressure, although rarely inclined to suppurate. Salivation has now reached its maximum and the odor is so very offensive that a child with this affection may taint the air of a whole room, or, when in a ward, it will be found necessary to use disinfectants to neutralize the extremely penetrating feter. The ulcerative process, instead of extending by apposition, will sometimes spread directly *per continuam*, so that we may find it in the fold of membrane joining the lower lip to the lower gum. Or there may be a space of comparatively healthy tissue between the ulcer upon this fold and the ulcerated gum which, it seems to me, can only be explained by taking the infectious nature of the process into consideration. By gravity the secretions from the diseased tissue have dropped into this fold, they have remained there, and, after a sufficient length of time

has elapsed, they produce the same process here that has occurred before. Reverting to what has been said in connection with etiology, it seems that the way in which this disease spreads to the rest of the buccal cavity from the gums is proof positive of the infectious character of the disease. In all cases it spreads by inoculation, however it may be accomplished; if the process is auto-inoculative it certainly is rational to suppose that, in a given patient in whom the same conditions exist as in the person affected, transmission of the affection is a possibility.

Upon the whole, stomatitis ulcerosa begins most commonly about the lower incisors; although there is no tooth about which it does not begin. In the very great majority of cases the disease first affects the teeth of the lower jaw, although this is a rule to which there are some exceptions. The teeth, in severer cases, suffer most from the disease; they are denuded, detached from their periosteum, fall out or are pulled out by the patient, who finds no difficulty in doing this on account of their being so much loosened.

Restitutio ad integrum may occur at almost any period of the disease, either as the result of treatment or, more rarely, spontaneously. When this does occur the fetor begins to disappear, the pulpous, yellowish mass is thrown off, the ulcer beneath it begins to clear up, and a new epithelial covering is formed over the place which was affected. When the bone has been affected there is more or less permanent loss of tissue; when a great portion of the alveolar process has been destroyed there remains a permanent loss of teeth, as both the temporary and the permanent teeth have been removed with the sequestrum. Rarely does it occur, as has been mentioned before, that the affection becomes chronic. It is more common for the affection to begin in a mild degree and remain for a great length of time; beginning, if such an expression might be used, as a chronic disease. These cases are characterized by a milder course, each symptom being less developed. The process does not cause the ravages that follow in the acute cases, the fetidity of the breath is not so noticeable, and is sometimes only present at certain times of the twenty-four hours, during the night or in the morning. I have never

seen necrosis follow in any of these cases,—a statement which is also made by Bohn,—and, upon the whole, these cases are identical in their clinical appearance with that form of trouble which dentists call “shrinking of the gums.” They are not so easily managed in regard to time, but constant treatment usually overcomes the affection. Relapses are the rule, but these, with ordinary watchfulness, are also readily cured.

The differential diagnosis is easy in every case. It frequently happens that aphthæ are developed at the same time with stomatitis ulcerosa, but if the clinical picture of both affections is kept in sight it is not difficult to say which spot is aphthous and which is that of stomatitis ulcerosa. As between these affections, the decision will always be easy except in the beginning, when a small aphtha develops just upon the same place where stomatitis ulcerosa begins. This, manifestly, would be a very rare occurrence, and the difficulty could exist in the beginning only; as soon as the aphtha is well developed all doubts as to the nature of the process would disappear.

Prognosis is influenced by three factors,—the disease upon which stomatitis ulcerosa depends, the stage of the affection when the patient comes under treatment, and, lastly, the treatment itself. When stomatitis ulcerosa is caused by rickets, scurvy, or syphilis, it rarely gets well until the constitutional affections are removed. The form of rickets which predisposes especially to this affection is the so-called acute form, which, however, is supposed to be scurvy in young children (Barlow, Rehn). Here we have the worst forms and the most intractable. One fact must not be lost sight of,—viz., that stomatitis ulcerosa may become noma (stomatitis gangrenosa, cancrum oris). On account of this fact every case of stomatitis ulcerosa should be most carefully watched, although this danger exists only for debilitated, so-called cachectic children. When necrosis of bone exists the prognosis is changed from that of an inflammation of the mouth to that of bone disease. However, even here the prognosis is not very bad when the condition is recognized, because it can be readily remedied by surgical means.

The *treatment* is both prophylactic and curative. It is necessary to remove all predisposing causes when possible. This consists in improving the general condition of health in

every respect,—good air, good food, cleanliness. When a case occurs in a family the other members must be protected from contagion. It is best to do this in all cases, notwithstanding the fact that the liability to affection must be very small because of the predisposing conditions necessary to produce the disease. When other members of the family are in a debilitated condition from any cause whatsoever, these precautions are especially demanded. In such cases it is well to give a mouth-wash of chlorate of potassium to the uninfected, and warn them not to use any utensil which has been used by the patient. In this way the spread of the disease is easily prevented.

There is hardly any disease which comes under our observation of which it can be so positively stated that a cure is accomplished by drugs as in the case of stomatitis ulcerosa. We have a remedy which can be looked upon almost as a specific. Chlorate of potassium given internally, and administered in this way purely for the sake of convenience, acts in a definite, well-observed way, and, with few exceptions, renders all other medication unnecessary. It is best given in a three-per-cent. aqueous solution, with a little syrup, of which from one-half to one teaspoonful may be administered every two hours, depending upon the age of the patient. There are only two objections to this remedy : one, the toxic effects which have already been mentioned, and the other the pain that is produced when it passes over the inflamed surface. I know of no means by which the latter can be prevented ; cocaine has its decided disadvantages, besides overcoming the pain only partially. Fortunately, this manifestation only lasts a short time (from thirty-six to forty-eight hours), and is a positive index to the curative effect of the drug. When the chlorate of potassium produces its specific effects the symptoms usually clear up in a peculiar manner. After the remedy has been taken for from twenty-four to thirty-six hours the salivation begins to diminish materially ; when the patient's mouth is opened it will still be found full of saliva, but it no longer flows out of the mouth. With the cessation of salivation the fetid odor disappears, and in a comparatively short time, usually within a week, all the symptoms have disappeared.

Now comes the time when the patient must be watched most, on account of the danger of relapses; any evidence of ulceration, be it ever so slight, demands a continuation of treatment or, frequently, the addition of some other remedy. A continuance of treatment, however, in mild or moderately severe cases forms the exception, not the rule. When ulceration does not disappear completely the cause must be found for this exceptional condition. This will usually be a carious tooth, which must be removed; if a permanent tooth, it must be treated by dental means, and if this does not stop the ulceration recourse must be had to cauterization of the gum with silver nitrate, as described in connection with the aphthous process. Where there is necrosis the sequestrum must be taken away—the sooner the better, as the process, although controlled by the chlorate of potassium, will break out afresh—or the patient's life may be jeopardized. In some cases no apparent cause exists for the keeping up of stomatitis ulcerosa; in these cases good results are obtained by the frequent use of potassium permanganate, applied with a brush.

The chronic cases do not respond to potassium chlorate as quickly as the acute ones. Even here, however, we get excellent results when combined with the local treatment just described. Nitrate of silver applied three times a week will destroy the specific process, care being taken not to touch more than the part affected, and after three or four weeks of treatment it will be found that the teeth become more firmly attached again and the patient restored. Unfortunately, relapses are even more common in this form than in the acute; these, however, will yield to the treatment just as readily as the first attack.

For the acute form the chlorate of potassium has been so completely satisfactory that other remedies, such as salicylic acid, salol, listerine, thymol, etc., will rarely become necessary, especially if the potassium permanganate is used. It is hardly necessary to add, although highly important, that in order to prevent relapses the general condition of the patient must be looked to, although in the attack itself the administration of tonics or reconstructives seems to have little or no effect.

(To be continued.)

ACUTE LOBAR PNEUMONIA IN CHILDREN.

BY CHARLES W. TOWNSEND, M.D.,

Boston.

(Concluded from March Number.)

D'ESPINE* speaks especially of these cases of pneumonia where the physical signs are late, obscure, or lacking. He classes them as central or congestive cases, and says they are frequent in children, and generally not recognized. The abortive form, where the fever lasts only two or three days, he also considers of frequent occurrence. Cadet† divides pneumonia into, first, cases with physical signs from the start; second, cases with tardy physical signs; third, cases without any physical signs, the lesion remaining central. My cases would certainly fit into this classification very well.

Dilatation of the *alæ nasi* and an expiratory moan or grunt are often mentioned as characteristic of pneumonia in children, and these symptoms may occur in children both in broncho and lobar pneumonia. Occasionally, when the respirations are increased in rapidity from any cause, as in abdominal colic, the nostrils dilate and the expiratory moan is heard, and I have noticed these symptoms not infrequently in these cases, and also in simple bronchitis, especially at times of nervous excitement. They are, therefore, not to be depended on in making the diagnosis. In 11 of my cases no mention is made in my notes of these symptoms; in 8 they were stated not to occur, all but 1, who was five years old, being in children seven years old or older. In 23 one or both symptoms occurred; thus in 12 the expiratory moan and dilatation of the nostrils occurred and in 11 others only the dilatation of the nostrils was observed. Of those who moaned all were under three years of age except 3, whose

* Rev. de Méd., February, 1888.

† *Vide* Ashby, Med. Times and Gaz., March 25, 1882.

ages were four and a half, six, and seven years. Of those whose nostrils alone dilated, 1 was nine years old, 1 eight, 1 seven, 1 six, and 1 five, the others being under that age. It is an interesting fact that children with acute pneumonia will breathe quietly but rapidly at times, without either dilatation of the nostrils or moaning, but any nervous excitement increases the frequency of the respiration and brings these on; and of the two, dilatation of the nostrils is more easily induced than the expiratory moan. In the case of a boy of six years it was several times noticed that in his sleep his respirations would sometimes change suddenly from forty to sixty in a minute without any apparent cause, the *alæ nasi* dilating with this change in the rate, and at times the expiratory moan would occur.

An examination of the charts shows that in all the respiration reached the rate of 40 in a minute at some time during the progress of the disease, and that the highest rate reached was 85. In only two cases did the pulse fail to reach 130, and in one case a pulse of 180 is recorded. The following table is a result of an analysis of the charts on these points:

Highest Pulse-Rate.	No. of Cases.	Highest Respiration-Rate.	No. of Cases.
180	1	85	1
160	6	80	1
150	5	75	1
140	4	65	4
130	10	60	6
120	1	55	4
110	1	50	2
		45	2
		40	8

A peculiar character is given to the lobar pneumonia of children by reason of the highly-strung nervous organization of these little patients and the frequency of nervous disturbances. So much is this the case that the term cerebral pneumonia is frequently used to describe cases of the disease in children. As has before been remarked, convulsions may take the place of the initial chill, and vomiting, as we have seen, is a frequent cerebral symptom. Beginning with a convulsion and going on to delirium or semi-stupor, with pain in the

head and abdomen, with little or no cough, no expectoration, and no chill, the physician is often put off the track, and imagines he has a meningitis to deal with. In 11 of my cases delirium was present, in 3 of which—children aged respectively six, eight, and ten years—it was violent; in the others it was mild. In 8 of these cases the pneumonia was basal, in 3 the lesion was situated at the apex. Seven other children with the lesion at the apex had no special nervous symptoms, a fact which is at variance with the common idea that cerebral symptoms are more apt to accompany an apex lesion. At times a state of semi-stupor may occur without preceding convulsions.

In a girl ten years of age the delirium began on the first day and continued, often noisy and violent, with occasional short rational intermissions, till the fifth day, when, at 4.30 P.M., she began to perspire freely, and became suddenly perfectly rational; her temperature was then 103° ,—it had been 102° in the morning,—and was still 103° at 6 P.M. She had a good night, sleeping quietly, and her temperature was found to be 98° in the morning. The sudden return to reason here preceded by several hours the drop in temperature. The consolidation in the lung continued twenty-four hours after the fall in temperature. The patient's decubitus at times during the delirium was on her face and knees, spoken of as the decubitus *en chien de fusil*. This case illustrates well the difficulty of making an early diagnosis. She was seen first on the second day of the illness, which began suddenly with vomiting and chilly sensations and pain in the abdomen, which was at times very severe; later she occasionally complained of pain in the right side of the chest. No cough had occurred at the time of my first visit. Nothing abnormal was found on examination of the chest, and the only significant sign was an increase of the respirations to 40, with the pulse at 132. This increase in the proportion of the respiratory- to the pulse-rate is, of course, a most valuable diagnostic sign. I put in my note-book that it was a question of acute pneumonia, scarlet fever with delayed eruption, simple febricula,—meaning by that a reflex rise of temperature from some unknown nervous disturbance,—or meningitis. Typhoid fever

in children sometimes begins quite acutely, and this should also be considered. Cough did not occur in this case till the third day, was slight throughout the sickness, and was never accompanied by expectoration. A careful examination of the chest each day failed to show signs of consolidation till the fourth day of the disease, when the right apex showed slight signs. These became very marked on the fifth day,—namely, dulness, loud bronchial respiration, bronchophony, and subcrepitant râles, at the right apex down to the fourth rib behind.

Herpes occurred in only three of my cases, of the lips alone in two, involving also the nose very extensively in the third case. Although hyperæmia of the tonsils and fauces was seen in some of my cases, none of them presented an erythema of the skin spoken of by Henoch,* or the measles-like rash described by D'Espine† and Cadet. Neither did I observe any forms described by Henoch as *pneumonia migrans*, when the seat of the lesion wanders in the course of five or six days from the lower lobe behind around the side and up to the apex.

Slight diarrhœa occurred in three or four of the cases. One case of pneumonia occurred during the course of typhoid fever, another during an attack of measles, and two others during the course of whooping-cough. In these last two diseases we are more apt to have broncho-pneumonia from an extension of the existing bronchitis.

The differential diagnosis from broncho-pneumonia can generally be made from the history. In the lobar form the sudden onset occurs, while in broncho-pneumonia there is the history of a preceding bronchitis, from which the pneumonia was more or less gradually developed. In some cases, it is true, the diagnosis is difficult, or almost impossible, when the history is imperfect, or where, as sometimes happens, a true lobar pneumonia arises during an attack of bronchial catarrh.‡ In both diseases we may find consolidation of an entire lobe, with evidence of bronchitis elsewhere, although in broncho-pneumonia the consolidation is more apt to be in smaller patches,—lobular,—and is generally bilateral. The symptoms of rapid respiration, moaning, dilating nostrils, and cough are

* Loc. cit., p. 349.

† Loc. cit.

present in both diseases. The temperature in lobar pneumonia is, however, generally more continuously high, while in broncho-pneumonia it is, as a rule, not so high, runs a more irregular and prolonged course, and never ends by crisis. The consolidation in the latter disease is apt to extend gradually and to vary in amount from day to day, and a fatal ending is not uncommon.

Henoch* says that "between the characteristic cases of fibrinous, lobar forms on the one side, and broncho-pneumonia on the other, lies an intermediate form, which cannot be defined with certainty," and he thinks it impossible to distinguish both forms of lung inflammation existing in the same case during life. The following case illustrates very well the difficulty. A little girl of two years, after a slight bronchitis of a week's duration, suddenly grew worse, vomiting, and having a high fever and rapid pulse, and, three days later, when first seen by me, a measles rash appeared. At this time her temperature was 104° and respiration 72, while nothing but a few scattered râles were to be found in the lungs. Another child, in the same house, had measles ten days later, confirming the first diagnosis. The next day dulness and bronchial respiration appeared at the right base, the signs of consolidation spreading gradually over the whole right back, and, ten days later, similar signs appeared in the left back. Two or three days before death, which occurred on the nineteenth day, both lungs were filled with râles, and both backs were dull over the lower halves. The temperature ran an irregular course, coming down to normal once on the eighth day, and afterwards oscillating between 101° and 103° . The comparatively sudden onset suggests lobar pneumonia, but the preceding bronchitis, the prolonged and irregular temperature, and the gradual extension of the trouble in the lungs are very characteristic of broncho-pneumonia. The onset of the measles adds an additional confusing element.

The coexistence in the same patient of both lobar pneumonia and cerebro-spinal meningitis is not very rare during epidemics of the latter disease. Here we find, in addition to the symp-

* Loc. cit., p. 347.

toms of pneumonia, persistent retraction of the head, arching of the fontanelle, severe headache, and frequently-recurring convulsions and coma. The respirations and pulse may be slowed, and may become irregular and intermittent, although this is not always the case.

The prognosis in uncomplicated cases of acute lobar pneumonia in children and infants, with the exception of those under two or three months old, is, I believe, always favorable, unless the patient is debilitated from some cause. Both of the fatal cases in my list were in but a poor condition to withstand an acute disease,—one a feeble, rachitic child, the other debilitated by a large superficial abscess, which had burrowed widely under the skin of the chest-walls. The case I saw only after death—the baby of eight days—gives rise to the question as to whether pneumonia is necessarily fatal at such an early age.

Schuyler* says the prognosis in children, “including patients of one year, where the disease is uncomplicated and the patients are otherwise robust, is decidedly good;” but he adds that in the very young—the new-born—and in foundlings the disease is very fatal. D’Espine† gives the case of a child of six weeks with acute pneumonia ending in recovery. There are a number of cases on record of children born with acute pneumonia begun *in utero*, all proving fatal. Grisolle‡ reports one case and mentions three others observed by Billard. Another case is reported in the *Lancet* of November 6, 1886.

D’Espine considers pneumonia in children essentially benign, and that it tends to get well unless harmful methods of treatment are employed. Of a considerable number of cases seen by him in fourteen years in Geneva, he has had only two fatal cases. Ashby§ says “the prognosis with regard to acute pneumonia in children, when uncomplicated, mostly points to a favorable termination. The percentage of deaths is small,—smaller, perhaps, than in any acute disease which attacks children.” And Henoch says that the prognosis in fibrinous pneu-

* New York Med. Jour., 1887, 541, etc.

† Loc. cit.

‡ Loc. cit.

§ Med. Times and Gaz., March 25, 1882.

monia, uncomplicated by diseases like nephritis, typhoid fever, or tuberculosis, is most favorable.

The following table of cases of acute lobar pneumonia in children, collected from various sources, shows a mortality of 28 in 1138 cases, or only a little over two per cent.:

Observer.	No. of Cases.	Deaths.
Baginsky*.....	60	4
Meigs and Pepper†.....	66	2
Barthez‡.....	212	2
Holt§.....	73	2
Pendleberry Hospital||.....	234	3
Ziemssen¶.....	201	7
Cadet**.....	70	0
Ashby††.....	26	0
Juergensen‡‡.....	110	4
Henoch§§.....	44	2
Townsend.....	42	2
Total.....	1138	28

I have not added the British collective cases to this list, believing that some of them are cases of broncho-pneumonia. Unfortunately, lobar and broncho-pneumonia are so frequently classed together that the idea prevails that *pneumonia* in children is a very serious and fatal disease. While this is true of broncho-pneumonia, it is, as we have seen, far from being the case with lobar pneumonia. Of this unnecessary confusion, a recent admirable paper by Holt||| is an example. Here, under the head of prognosis, he states that there was a general mortality of twenty-two per cent. in his 173 cases; but, on looking back, we find that of these 173 cases 100 were broncho-pneumonia with 34 deaths, and 73 were lobar pneumonia with only 2 deaths.

For treatment, considering the favorable tendency of the disease, all active debilitating measures should be avoided, and

* Deutsche Med. Wochenschrift, 1880, vi. 556.

† "Diseases of Children," 7th ed., 1882.

‡ Brit. Med. Jour., December 24, 1864.

§ New York Med. Rec., April 7, 1888, p. 385.

|| Quoted by Holt, loc. cit. ¶ Quoted by Juergensen, loc. cit.

** Quoted by Ashby, loc. cit. †† Loc. cit.

‡‡ Ziemssen's "Cyclop. Americ.," ed. 1875, vol. v. p. 138.

§§ Loc. cit. ||| New York Med. Rec., April 7, 1888.

our attitude should be one of watchful expectancy. Dr. Minot,* in an article on the treatment of acute pneumonia, says, "I would plead for little children, who like nothing so well as to be left undisturbed by officious ministrations." Nourishment the child can take only in the liquid state, and milk in small quantities at frequent intervals is the best and most convenient form. At times the child persistently refuses all food and cries only for water. As the course of the disease is short, it is not necessary to systematically feed the patient, as in a long debilitating disease like typhoid fever, and the child will generally take all the milk that is necessary. Where relapses occur, thus prolonging the illness, more attention to the diet is required. Stimulants are rarely called for. Nine only of my cases received them, most of these being my earlier cases, when I thought it was more necessary.

Attention to ventilation of the chamber is, of course, of great importance in a disease where the lungs are involved, and the inhalation of oxygen gas is undoubtedly of great value. Medicine of some sort all my patients received, but this was given, not so much for the patient, but as a placebo for the mother's mind.

Carbonate of ammonia in small doses was given in twenty-five cases, nitre and bromide of potash in six each. None of these drugs, it seemed to me, influenced the course of the disease, and their administration was often rebelled against by the little patient.

Antifebrin was used in four cases, in all reducing the temperature temporarily, with, in one case, a cessation of the delirium for four hours, but having no effect, beneficial or otherwise, on the general course of the disease. In one case where it was given two relapses occurred, but it is hardly fair to consider the drug responsible for these. D'Espine† puts antifebrin and antipyrin among the harmful means of treatment for pneumonia in children, and considers them dangerous.

Morphine in small doses was given in six or eight of the cases, and was decidedly beneficial in quieting the pain and restlessness. This drug, given occasionally and with judgment,

* Boston Med. and Surg. Jour., ex. p. 169.

† Loc. cit.

seems to me of much value in this disease ; but it is, fortunately, not needed in all cases.

In the 212 cases treated by Barthez* in the Hospital St. Eugenie, with only two deaths, there was no treatment in one-half the cases, in a large number it was insignificant, and in one-sixth only was it active. Previous to this, when he had employed bleeding and other debilitating forms of treatment, one-seventh of the cases in his hospital practice had died.

Of local applications, the old-fashioned plan of putting on a jacket poultice is to be avoided. It is heavy, making the already difficult breathing still more difficult, while our object is to make the patient as comfortable as possible ; a small poultice over the seat of the pain is, however, decidedly beneficial, and, strange as it may seem, I found that a poultice over the abdomen, when the pain was seated there, frequently gave great relief, and procured a comfortable night's rest. As a rule, when the pain could not be localized, I had a poultice applied over the lower part of the chest in front and the upper part of the abdomen, with good results. The softness and moisture of a hot poultice seem to make it preferable to a hot-water bag. In a few cases a tight swathe to restrain the movements of the chest-wall seemed to be beneficial.

Knowing that pneumonia generally gets well of itself in children, and that it often runs a short or abortive course without treatment, one is inclined to smile at the cases reported as aborted or cured by means of drugs.

To summarize: Acute lobar pneumonia in children is carefully to be distinguished from lobular or broncho-pneumonia, from which it differs widely in etiology, course, and prognosis. Lobar pneumonia, although often unrecognized, is of frequent occurrence even in the youngest children.

The cardinal symptoms found in the adult, of rigor, localized pain in the affected side, cough with bloody expectoration, and a continued high temperature, all may be obscured or lacking, with the exception of the high temperature which generally ends by crisis.

The onset is sudden, with vomiting, and occasionally a con-

* Loc. cit.

vulsion, very rarely a rigor. Pain, if it can be localized, is frequently seated in the abdomen, or diffuse on the affected side. Cough is sometimes absent during the first two or three days. Expectoration in children under eight years of age is usually lacking. Cerebral symptoms are often marked. Dilatation of the nostril and moaning on expiration are frequently present, but also occur in other diseases.

Physical signs are often tardy in revealing themselves.

The prognosis is very favorable except in the new-born, unless the child be debilitated from some other reason.

Active or debilitating treatment should be avoided, as the natural tendency of the disease is to recovery.

STOMACH-WASHING IN INFANTS, WITH A DEMONSTRATION ON THE LIVING SUBJECT.*

BY A. SEIBERT, M.D.,

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I DESIRE to call attention to a method of treating gastrointestinal disturbances in infants which has long since been employed in adults. About twenty years ago Kussmaul introduced the washing out of stomachs in adults. In 1880, Professor Epstein, of Prague, recommended this mechanical treatment of gastric troubles in infants and children (*Prag. Med. Woch.*, 1880, No. 45). His recommendation, though, was not heeded by the profession at large, so that but very few physicians interested in diseases of children could show up experienced data at the sixtieth annual meeting of Natural Scientists and Physicians in 1889, at Wiesbaden, when Epstein once more called attention to this remedial procedure. Among these few were Ehring, Escherich, Lorey, and Demme, their reports being most favorable.

* Read at a meeting of the Section on Pediatrics of the N. Y. Academy of Medicine, November, 1888.

Over five thousand children have been treated in this manner at Epstein's clinic, the result being better than with any former method.

The indications for this treatment are the following:

1. In dyspepsia of infants, a condition characterized by the regurgitation of part of the child's food soon after each meal. This vomiting occurs entirely without nausea, and is due to the child drinking too fast, too often, or too much at a time, or all three causes may exist together, and generally do so. The babies afflicted are usually less than six months old. These nurslings have been termed "spitting" children, and old sage women claim that they are particularly thriving children. In reality the opposite is true. The children gain flesh and weight slower than perfectly normal ones, if at all. Often the weight remains stationary, their skin is not clear and fresh, their muscles flabby, and their color always pale. The stomach is gradually weakened more and more, and in this wise is prepared for future serious illness.

In many cases we may effect a cure by properly regulating the diet (giving food at greater intervals and in smaller quantities), but some will prove obstinate, the vomiting will continue in spite of diet and medicines, and the children will ultimately grow withered and shrivelled.

A single stomach-washing will often suffice to check the vomiting and cure the case. Lumps of casein which often have been in the stomach for days are usually brought to daylight. These remnants of former meals cause the irritation of the stomach and produce vomiting; they, of course, are the result of the inability of this organ to fully do its work. These lumps need not show any signs of decomposition, but they are very hard, like chamois-leather to the touch, and, in being ultimately carried along the intestinal canal, by means of their size give rise to the constipation these children are often habitually afflicted with.

My cases of this category amount to twelve. The children were from seven weeks to ten months of age. The worst and most obstinate case was the youngest child, seven weeks old. This female baby was the first child of its mother, who was totally ignorant on the question of how to feed her offspring.

Pure cow's milk had been given in this case at intervals ranging from one to four hours, as the child would have it. I found a child which had weighed about seven pounds when born now weighing but three. Not a particle of adipose tissue was left, the muscles very thin and flabby, the skin grayish in color, covering the body in big folds, and dry to the touch. The face was full of wrinkles, the cheeks and eyeballs sunk in, the whole aspect that of a very old man. There had been no marked diarrhoea, but usually constipation, necessitating medicine or enemata to empty the bowels. Throwing up of food had been noticed since birth, but had gradually grown worse, and now the child would vomit almost the whole of the food taken shortly after nursing. Even water would come up again after a few minutes. Between the intervals the child would cry and moan for hours, especially at night, making the mother and the whole household miserable.

I proceeded at once to wash out the stomach with plain warm water. There was some difficulty at first in getting all the casein up, as some of the clots were too large to pass through the tube, but on again and again letting water in and out, these food-remnants ultimately broke and dissolved into bits small enough to escape through the catheter. After this washing a large enema with soap-water and sweet oil was made, suspending the child by the feet somewhat while gently pressing the abdomen from one side to the other while the water was in the bowel, thus bringing it far up above the rectum and mechanically softening and breaking up the hard faeces before they came out. Then four powders containing three-quarters of a grain of calomel each were given, one every hour, and the child put on plain barley gruel (without milk), an occasional teaspoonful of water and whiskey (five drops) and black tea, for the next twenty-four hours.

The vomiting stopped immediately after the first washing, never to return again. Soxhlet's apparatus was ordered, and the child fed on milk and barley the next day and ever since, making a speedy recovery *without further medication*. The washing was only repeated once in this case, and only at the special request of the mother.

All of the eleven other cases of infantile dyspepsia were

treated successfully the same way, only two children requiring two, and only one of them needing three, washings (at intervals of two days) to fully restore the digestive power of the stomach.

I certainly could show up a greater number of patients suffering from dyspepsia and treated in this manner, but parents will in most cases never consult a physician about this condition,—a condition often overlooked by the physician, and, if noticed, not valued enough to begin treatment. This is wrong. We ought to remember that these dyspeptic infants may some time not too far off have to make use of all of their power of digestion and assimilation of food in an attack of pneumonia, scarlet fever, diphtheria, or cholera infantum. If they are weak when their illness begins their chances are worse, but if their natural digestion is already poor, what will become of it now, and what of the child? It is an old habit of practitioners to underrate the importance of such trifling troubles in a baby as this, and yet this negligence alone may cause the death of the child later on.

2. In *acute gastro-intestinal catarrh*, or *cholera infantum*, the washing out of the stomach, as soon after the beginning of the vomiting as possible, will in many cases save the life of the child. It cleans the stomach of remnants of decomposed and decomposing material, of the germs of decomposition as well as the *results* of this process, as in particular the tyrotoxon of Vaughan, which contents are lodged in the folds of the mucous membrane of the infantile stomach and adhere to the walls of that organ. To many of us there is no doubt that the extreme prostration of such children and the extreme collapse is due not alone to the want of water in the system in consequence of the many copious stools, but also to poisonous substances entering the circulation by absorption from the stomach. If this be true, then the thorough cleansing of this receptacle for food ought to be of great value in these cases, and so it is.

I have treated twenty-nine children during last summer who suffered from fresh attacks of vomiting and diarrhoea, from three months to one and a half years of age, by simply washing their stomachs. In only four cases did the children die, two of them (twins) passing out of treatment after one visit.

In these four cases vomiting continued, and this vomiting, then, is not due to irritation of the stomach alone, but to the nerve-centres being irritated and no doubt already in a state of passive hyperemia, previous to pronounced œdema of the brain and its coatings. In other words, these cases were too far gone to cure them by this method alone, but still I thought it my duty to wash out the stomach, as the poison remaining in the stomach might at last kill the child, while the portion already absorbed into the system might prove insufficient in quantity to do so alone. The result proved that my supposition was partly wrong, as too much of the poison had already acted upon the nerve-centres. In one of the cases the attack had begun thirty-six hours previous to my first seeing the child, the patient was only four months old, bottle-fed, had all the symptoms of acute hydrocephalus and heart-failure, and died six hours after the washing.

We may ask if this procedure did not weaken the child and hasten its death? My answer is "No." All the other twenty-five cases of cholera infantum not alone got well but showed marked signs of improvement immediately after this treatment in every instance, so that there can be no doubt that instead of depressing the children, stomach-washing has a *stimulating influence*. Of course the children gag when the tube passes the pharynx and upper œsophagus, but this retching soon passes over. Without exception within a few minutes after finishing the washing the children go to sleep, and sleep sound for two to four hours. The mothers are agreeably surprised to see their children rest so well, when previous to this treatment they tossed about restless and groaning, or, what is worse, were lying in utter helpless collapse with eyes half open, only showing signs of life when tempted to drink, which nourishment was of course thrown up again. The pinched nose, the coldness of the extremities, and the haggard look usually disappear during this sleep, and on awakening the children are remarkably changed to the better. Vomiting and nausea have ceased once and for all; one or two more movements of the bowels may yet occur, but as a rule the case is cured by one washing. In all of my cases (excepting the above-mentioned four) did vomiting cease immediately, even

then when milk was given three hours after the washing. In sixteen cases I also ordered nitrate of silver in very small doses, but not to be given until at least four hours after the washing. This was given for checking the watery discharges from the small intestine. In all cases appetite appeared within from two to six hours after this treatment.

To disinfect the stomach, the intestines, and their remaining contents has been attempted for the last few years. Resorcin, naphthalin, benzoate and salicylate of soda have been tried and recommended. All of these remedies may be well enough, but they often fail if they are retained, which generally does not occur as long as nausea is present. These drugs do not check the vomiting; they certainly can only destroy a very small portion of the germs of decomposition, as they are hardly strong enough and as they only reach the lower pyloric end of the stomach, while the germs and the tyrotoxicon may adhere in safety to the upper and lateral walls of the organ, without ever coming in contact with the antiseptics sent after them.

How different it is with stomach-washing! The *whole* stomach is filled with warm water, the latter is churned and splashed all over its walls by the movements of the child (if necessary brought about by shaking the baby), and every particle of obnoxious material, whether solid or fluid, whether microbe or chemical poison, is immediately drowned in the fluid, and within a few seconds carried out of the body, where it can do no more harm.

It is this mechanical diluting of the poisons in the child's stomach, and their being swiftly despatched out of the body, which constitutes the action and value of this remedial undertaking.

3. In cases of *chronic* catarrh of the alimentary tract stomach-washing has proved to have given the *best results* of any form of treatment. Cases that have withstood all kinds of diet, all known old and new drugs, cases that have been diagnosed as atrophy, marasmus, tuberculosis of the intestine, etc., have been cured by this treatment.

The reason for this is evident: Remnants of food are retained in the stomach (casein may remain for days, proven by direct experiment), decomposition and fermentation is constantly going on in a mild way, and every additional food-

supply is immediately infected by contact with the food left in the stomach from former meals. The decomposing food is carried along the intestinal tract and keeps up the pathological condition of its mucous membrane.

In cases of this kind stomach-washing is analogous to the thorough irrigation of an abscess or the pleural cavity in empyema, for here also fetid, decomposing material is taken away and rendered harmless, and then and only then can proper diet, properly administered, do the work of building up the children heretofore given up to die as hopeless cases. Irrigation of the large bowel three times a day of course will necessarily be associated with that of the stomach, but the latter need not be repeated more than two or three times, at intervals of forty-eight hours' duration.

I have thus treated fifty-two cases of chronic gastro-enteritis in infants within the last twelve months, and *every one with perfect success*. Two-thirds of the cases were intense and of long duration, and the children nothing more than skin and bones. In a few cases I washed six times, and in the majority only two times, before bringing the child on a fair way of recovery. In all medicine was used so little, and then only symptomatically and with great precaution as to its interfering with digestion, that I can claim that these children were cured by stomach- and bowel-washing alone.

A few more words about the method. I never use anything but *plain warm water* from the hydrant, and if possible boiled first and cooled off in a pitcher covered with a clean towel. The enemata made by the mother are always given with boiled water. I use no medicines in the water for the stomach, because I have convinced myself that only harm can come from them. The experiments made under Robert Koch (*Mittheil. aus dem Kaiserl. Gesundheitsamt*, Berlin, Bd. i.) regarding disinfectants prove that such weak solutions as we are compelled to use in stomach-washing are of little if of any value, and being readily absorbed can and will do harm, as Escherich (*Jahrb. f. Kinderheilk.*, 1887) and others have experienced with resorcin. So far I am alone in this opinion of only and in all cases using pure water for stomach-washing, but my method has the advantage that we can employ it on any child, no mat-

ter how weak and feeble it may be. Besides, there is nothing in the fluid to aggravate the irritation of the mucous membrane, and part of the water being absorbed during the proceedings, it necessarily will have a stimulating and reviving action on the whole system.

It is well to begin with small quantities of water. If too much is allowed to flow into the stomach at first the child will vomit. This is nothing serious, and in cases of cholera infantum, where we have to act promptly and to get as much poison as possible out of the stomach as soon as possible, I invariably fill up the stomach to the top, thus producing a rapid expulsion of the water, while the tube is simply held in position. In all cases washing has to be repeated until the water comes back clear and transparent.

Care should be taken that the tube is not pushed down too far, as it will double over in the fundus and a part of the water will remain. If the tube is occluded by casein or other particles of food, I have found it expedient to blow air into the tube and thus to force out the hinderance.

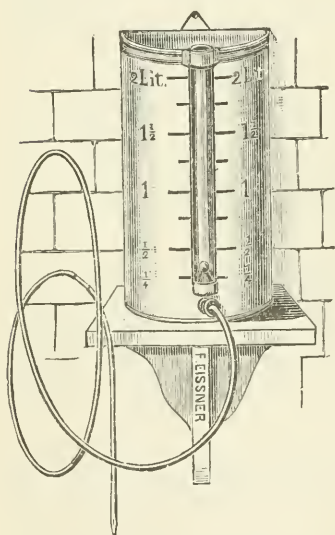
It is of course understood that in cases of dyspepsia and of chronic gastro-enteritis it is absolutely necessary to wash out the stomach when it is as empty as possible, two and a half to three hours after the last meal, which in nurslings should be a small one, and in bottle-fed infants should consist of barley-gruel alone, without milk.

It is also understood that *all* gastro-intestinal disturbances in infants and young children are benefited more or less by stomach-washing.

I never saw any bad results or accidents from or during this procedure. The mothers were all highly pleased with the operation and not one of them stayed away, the twin cases in Dr. Boldt's practice excepted. Most mothers would have liked me to perform washing out even oftener than I did. In the chronic cases all mothers became warm friends of the author, and not without cause.

The child I will now perform stomach-washing on was fifteen months old when first brought to my clinic at the New York Polyclinic. This was six weeks ago. It had been sick over four months with chronic diarrhoea and occasional vom-

iting. It had been treated by a number of practitioners and had taken innumerable medicinal remedies. It had failed steadily, until at last its weight had been reduced to seven and a half pounds. We washed out the stomach, irrigated the bowel, gave only barley-gruel without milk for two days after a few calomel powders, then gave one-fourth milk and three-fourths barley-gruel, sterilized in Soxhlet's apparatus, washed out once a week, three times in all, and now you can see that the baby has picked up rapidly, having gained at the rate of a little over one pound each week in these six weeks, and now weighs sixteen pounds!



Apparatus for Stomach-Washing.

Demonstration.—The clothes and bandages of the abdomen being loosened, the child is placed upright on the lap of the mother. Guided by the left index finger, which presses down the tongue, a soft, velvet-eye catheter is passed over the tongue into the pharynx. Here the muscles of the upper œsophagus contract and we feel an impediment, which is readily overcome by slight patient pressure. Slowly the catheter glides into the stomach. We now attach a glass tube in connection with the hose of the fountain, open the crank, and allow the water to flow.

After about a cupful has passed in we first shut the crank, detach the hose from the glass tube, incline the child forward and let the water run out, which it does readily; the outer end of the catheter being lower than the inside terminus.

122 EAST SEVENTEENTH STREET, NEW YORK.

THE RISE AND PROGRESS OF DIPHTHERIA IN CHICAGO.

BY CHARLES WARRINGTON EARLE, M.D.,
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WE have no record of the health of the early settlers of our city. Cholera was brought to us in 1832, from Quebec, and during the following year, 1833, the town authorities began to pay attention to the Chicago River by the declaration that it was unlawful to throw or put into said river any carcass of dead animals, under a penalty of three dollars.

In 1834 the first board of health was established, but its existence was short and its functions exceedingly limited. From this time till 1859 (twenty-five years) the word "diphtheria" does not occur in any reports to which I have access. May 9, 1837, Dr. Daniel Brainard was appointed health officer, and in 1841 an attempt was made to collect and have recorded mortuary statistics. No record, however, can at this day be found.

In 1851 records of mortality were commenced and deaths from croup tabulated. It is, of course, difficult at this time to say that some of these cases were not diphtheritic.

During the years 1852 to 1860 deaths are recorded from "cynanche maligna," "cynanche tonsillaris," "canker sore-throat," and "canker in the throat;" but no mention of diphtheria. In all probability these deaths, or nearly all, were really from diphtheria.

The following table will show at a glance the number of deaths from diphtheria since the disease was recognized, but we must remember that even during this period the old nomenclature has not been entirely abandoned, and the profession has not fully decided as to the unity or duality of croup and diphtheria. Until these questions are settled all statistics concerning these diseases will be imperfect.

*Mortality from Diphtheria in the City of Chicago from
1860 to 1888.*

Year.	Deaths from Diphtheria.	Year.	Deaths from Diphtheria.
1860.....	154	1875.....	125
1861.....	112	1876.....	464
1862.....	74	1877.....	333
1863.....	137	1878.....	294
1864.....	115	1879.....	604
1865.....	167	1880.....	930
1866.....	134	1881.....	609
1867.....	78	1882.....	521
1868.....	87	1883.....	529
1869.....	130	1884.....	649
1870.....	164	1885.....	706
1871.....	96	1886.....	944
1872.....	148	1887.....	1002
1873.....	92	1888.....	858
1874.....	78		

From 1859 to the present time diphtheria has always been with us, the death-rate ranging from 78, the lowest, in 1867, to 1002, the highest, in 1887.

Since 1876 there has been a marked increase in the number of deaths from diphtheria. Of course, our population has increased very greatly; but the death-rate from this disease is beyond what it should be. The death-rate from all causes has diminished during the past five years, yet increased from diphtheria.

For instance,—

In 1868 the mortality was 23 + to each 1000 of population.

In 1869 the mortality was 23 + to each 1000 of population.

In 1870 the mortality was 24 + to each 1000 of population.

In 1871 the mortality was 20 + to each 1000 of population.

In 1872 the mortality was 27 + to each 1000 of population.

Average, 23 + to each 1000 of population.

The diminution in the death-rate from all causes is seen in the following table :

In 1883 the mortality was 19 + to each 1000 of population.

In 1884 the mortality was 19 + to each 1000 of population.

In 1885 the mortality was 18 + to each 1000 of population.

In 1886 the mortality was 19 + to each 1000 of population.

In 1887 the mortality was 20 + to each 1000 of population.

Average, 19 + to each 1000 of population.

The increase from diphtheria is seen by the following :

In 1868, population 252,054, there were 87 deaths from diphtheria, or 1 in 2897 population.

In 1873, population 380,000, 92 deaths from diphtheria, or 1 in 4130 population.

In 1876, population 420,000, 464 deaths from diphtheria, or 1 in 905 population.

In 1880, population 503,298, deaths from diphtheria 930, or 1 in 541 population. This was the highest mortality ever reached.

In 1884, population 630,000, 649 deaths from diphtheria, or 1 in 970.

In 1887, population 760,000, 1002 deaths from diphtheria, or 1 in 758, suburban towns included.

Considerable alarm has been created by statements in the daily press that an epidemic of a very grave character was present with us during the year just closed. The facts are that in 1888, population 810,000 to 850,000, suburban towns included, we had 858 deaths from diphtheria, or 1 in 946 to 990, the *lowest mortality* in eleven years.

The greatest mortality has been, until recently, in the poorer wards, where people lived below grade and were crowded into houses. For instance, in 1880 the mortality in the Fourteenth and Fifteenth Wards was 291 out of a total death-rate from diphtheria of 930, thirty-five per cent. of all the deaths. The mortality in the stock-yard ward has always been high. This has been brought about because of the large population in these wards and bad hygienic surroundings. These conditions always give a large mortality when infection has once taken place. The sanitary condition of these wards has recently been greatly improved, particularly in raising the grade, increasing the sewerage, and personal inspection on the part of the health officers.

It has now come to be not an unmixed blessing to live in a good ward, for the truly good have been allowed to do as they please, and the poor are inspected and their habitations made

clean. As a result, in the year when the mortality has been the lowest throughout the city (1888), 1 death from diphtheria in about 950, we have had in the Tenth, Eleventh, and Twelfth Wards 132 deaths, and in the Fifteenth, Sixteenth, and Seventeenth Wards (the old Fourteenth) 126 deaths.

What we need, then, at this time is greater precaution in the way of isolation and sanitary watchfulness, and I am not sure but the greatest good which this society could do to the community would be to commence an agitation which would give to our health department full and complete control of it. Personally, I am of the opinion that the time has come for the city to take charge of every house infected with this terrible scourge.

NOTE ON THE TREATMENT OF ENURESIS NOCTURNA.*

BY SIMON BARUCH, M.D.,

Physician to the New York Juvenile Asylum and Manhattan General Hospital, New York.

AMONG the so-called minor ailments of childhood we encounter none which give rise to more distress, care, and anxiety than the involuntary discharge of urine during the sleeping hours. The child's night-clothing is soiled, its bedding soon becomes unfit for use, and, as the occurrence becomes more and more frequent, the mother grows more unhappy, until, at last, advice is sought. Unfortunately, an erroneous conception of the infirmity often causes delay of medical treatment.

About the beginning of the twentieth month a child may, as a rule, be taught the uses of a vessel and the necessity for systematic emptying of the bladder. There are some children, however, who are supposed to be somewhat backward in this respect. These are indulged for a time, they are cajoled and

* Read before the Pediatric Section of the New York Academy of Medicine, December 26, 1888.

persuaded to keep themselves clean, and, these methods failing, they are not infrequently regarded as wilfully disobedient, and are subjected to punishment.

I will not reiterate here what is well known to you, and what all our text-books tell us on this subject, nor dwell upon the varieties usually referred to. It is my aim to present to you some brief, practical notes on the most common type, enuresis nocturna, derived from private practice and from my experience in the New York Juvenile Asylum. The latter institution cares for nearly one thousand children, from six to fourteen years of age, who are gathered from all parts of the city by the various agencies laboring for the reformation and proper care of children whose parents are either unable to manage them or who are waifs without friends or protectors. After residing in the institution a few months, the regular life, good food, and appropriate yet gentle discipline render them strong and healthy, so that they compare favorably with children among the well-to-do classes in physique and power of resistance to disease. Among these children, the percentage of cases of enuresis nocturna is about ten. This is a larger number than is generally supposed to exist, and I believe it is much larger than in private practice. In the latter the disease is notably overlooked, and not treated in children who are not regularly in the habit of wetting their bed, while in the former the care of many children congregated in large wards necessitates the grouping of all incontinent cases in separate wards. The wet-bed wards of the New York Juvenile Asylum contain eighty beds, each of which has a rubber cover strapped securely over the mattress, and over this a blanket : the beds are ranged in rows, indicating the severity of the cases. Thus the worst cases occupy the beds in the immediate vicinity of the ward water-closets, and each successive row represents a milder type. The children are compelled to evacuate the bladder before retiring, and they are awakened once or twice during the night by the ward officer who is on guard. Thus every precaution is taken against overfilling the bladder. The children are offered various rewards for cleanliness; they gain the privilege of removal from this ward of disgrace by promotion from the worst to the best row. Cor-

poral punishment has also had its day, as well as triangular blocks, which were used by one of the earlier attendants of the institution for the purpose of forcing the children to lie upon their sides. But the result of all these non-medicinal measures has been unfavorable; a very small number have improved, only to lapse again into the habit. We have, therefore, ample evidence that these poor children should not be blamed for an act which is committed in the very large preponderance of cases unconsciously, and that, therefore, punishment for this involuntary and uncontrollable act is cruel and unjust. Indeed, it only serves to aggravate the trouble, rendering children more nervous and apprehensive, and thus increasing the urinary secretion considerably.

There are, doubtless, various causes at work in the production of this infirmity. General debility, acid urine, adherent prepuce, constipation, ascarides, lithates in the urine, and a number of other agencies have been regarded as exciting causes. But I must confess that I have failed to discover any of these etiological factors in private practice, and I am still searching for them in the public institutions with which I am connected. Suffice it to say, for the practical purposes with which we are now concerned, that I have faithfully tried tinc. ferri mur., syr. ferri iod., tinc. nux vomic., tinc. belladonnæ, hydrate chloral, blisters to the nucha, cold sponging, friction, local faradization, and anthelmintics. Thus far I have failed to obtain benefit from any one of these remedies. Circumcision, so highly lauded upon theoretical and clinical grounds, has not appealed to my judgment, because local irritation from the preputial surface has not presented itself as a prominent symptom, but chiefly because I have encountered the infirmity frequently among circumcised boys in private and hospital practice.

In the New York Juvenile Asylum one of my enthusiastic predecessors once proposed to the directors to relieve the institution of this unpleasant incubus by circumcising all the boys affected. But the directors to whom the matter was submitted, applying their excellent common sense to the decision of this question, declined this general preputial slaughter, because it would have no effect in the case of the girls, who suffer quite

as frequently as the boys. This practical argument disposes better of the theory upon which circumcision is recommended than an elaborate theoretical discussion. I was surprised to learn from the intelligent superintendent of the Hebrew Orphan Asylum in this city, that among its five hundred and forty inmates only *about* one per cent. are troubled with incontinence of urine, there being three hundred (circumcised) boys among this number. On the other hand, we average among the thirty-six thousand children cared for at the New York Juvenile Asylum since its existence ten per cent. of incontinent children, the average being nearly the same in boys and girls. Townsend (ARCHIVES OF PEDIATRICS, 1887) states that among the out-patients of the Boston Children's Hospital twenty-one and a half per cent. of all cases suffer from enuresis. Morris, of Baltimore, found five per cent. of the children in an orphan asylum thus affected. I have applied to the physicians of several large institutions in this city for information upon this subject. I regret that I have received no replies, because there appears considerable difference in the above statistics to be reconciled. Still, the fact that among the (circumcised) boys of the Hebrew Orphan Asylum incontinence is remarkably rare does not necessarily imply that circumcision plays an important rôle, since the superintendent claims a similar immunity among the girls of his institution. And in the New York Juvenile Asylum we make the interesting observation, for whose accuracy I can vouch, that *among sixty incontinent boys there are twelve circumcised*, eleven of these being Hebrews. Hence, if twenty per cent. of the whole number of incontinent children are among the circumcised, and if, as appears from the record, the infirmity is vastly more frequent among the circumcised children of this institution than among those uncircumcised, we may fairly doubt the value of circumcision as a remedy. Still, Adams highly lauds this treatment (ARCHIVES OF PEDIATRICS, 1887) in a paper in which he furnishes an elaborate anatomical demonstration of the nerve-supply, through which the reflex produced at the prepuce is shown to be conveyed to the muscular structures of the bladder.

The question why the surgical and medicinal management

of these cases, though highly lauded by other colleagues, has so often failed in my hands, has afforded me much food for reflection.

I am disposed to assign the want of success to three causes,—

First. A difficulty of applying the remedies recommended to the theoretical indications laid down by the authors in question.

Second. The impossibility of applying these remedies to the parts supposed to be involved.

Third. The absence of evidence that the system, or the part affected, has really been brought under the influence of the remedies administered.

Upon the first of these causes I have ceased to expend any more thought. I have shown in the case of circumcision the fallacy of the reasoning, although the practice is doubtless a useful one in many cases, being attested by reliable authors. The same remark may be applied on the subject of blisters to the nucha, so energetically recommended by Harken, on the ground that a congestion of the medulla is the *fons et origo mali* here; and sustained too by clinical facts. Although I am satisfied that the only rational method of therapeutics is that which takes intelligent cognizance of the causes of disease and their *modus operandi*, I have found it impracticable to reconcile the various conflicting theories advanced, and have therefore sought refuge, for the present at least, in the more empirical management of enuresis nocturna.

The second cause of failure is one that I have not been able to overcome until recently. I had not succeeded in producing the local effect upon the supposed pathological condition of the muscular apparatus of the bladder because it was necessary to introduce the remedies into the blood in sufficient quantity to make a decided impression, and such a quantity I hitherto regarded as toxic. With regard to local faradization, so highly recommended by Ultzmann on theoretical grounds but not by him well sustained by clinical records, I desire to say that I have given it a fair trial on the strength of Ultzmann's name, in private as well as public practice. The ward officer in the latter was carefully instructed, by demonstration on the children, to introduce the rectal electrode and to apply the current

as strong as the children could bear it. The children, I regret to say, were really tortured, and a very few were for a few nights influenced by the moral effect of fear. But there appeared to be no good result, because, even though the theory of a neurosis of the bladder muscle be correct, it is utterly impossible to accurately apply the faradic current to the entire muscle or its nerve-supply.

And now I come to a third cause of failure, which may be and has been readily overcome during the past twelve months of my practice. Here I may say that amid the multitude of remedies already so highly recommended it would be an act of supererogation to appear before this learned body with a *new remedy*. But it is not a new remedy that I propose to advocate. On the contrary, it is the trite and well-recommended belladonna, or rather its alkaloid atropia. Many have, like myself, failed to obtain the good effect which others have since its recommendation by Trousseau derived from it, and it is my aim to emphasize in this brief paper the cause of failure, and ascertain from discussion if a better and more uniform result may not be expected by the recognition of the fact that *belladonna has been used indiscriminately and without due regard to the necessity of bringing the system completely under its influence.*

The idea is gradually taking possession of me that in therapeutics we obtain the best and only positive results from such remedies which produce definite physiological effects in health. Thus we depend confidently on quinine to prevent the recurrence of a malarial paroxysm, *when its physiological effect*, tinnitus aurium, is distinctly felt before the expected onset. We all know how often large doses of quinine have failed to effect a cure of malarial fever, when a smaller quantity administered in more soluble form and producing tinnitus aurium has succeeded. Again, we may, in the large majority of cases, confidently anticipate relief from the pain of pure articular rheumatism, when one of the physiological effects of the salicylates, which also happens to be tinnitus aurium, is distinctly manifest. We may confidently expect to check an ordinary diarrhœa by opium, when a pronounced narcotic effect, be it mild or intense, is manifested.

Would that I could enumerate a larger number of these trite therapeutic truths in support of my view. But unfortunately the limit is almost reached, and with it the limit of positive results. The future of medicinal therapeutics, empirical as the latter must needs be to a great extent, lies in the direction of the study of positive remedies whose penetration into the blood may be manifested by pronounced definite phenomena.

Such a remedy is belladonna, and its active principle atropia. Since we have learned to treat enuresis nocturna with the definite idea of bringing the system under its influence at the time of expected need,—viz., before retiring to bed,—the treatment of this *opprobrium medicinæ* has become far more satisfactory. And this result is in accordance with the ascertained facts regarding the influence of atropia upon the motor nerves. Large doses were required by Spilgman and Luchsiger (quoted by Brunton) to paralyze the motor nerves. I am inclined to the theory that nocturnal incontinence of urine in children is due to an absence of inhibitory action upon the detrusor muscle of the bladder. The latter contracts in these cases involuntarily during sleep; that much is certain, although we are in the dark regarding the true initiative of this contraction. If, however, we may paralyze this muscle during the sleeping hours, we must succeed in inhibiting it empirically. It may be argued that if this were the true action of atropia, the sphincter vesicæ would be similarly affected, and its paralysis would facilitate the passage of urine, since it is presumed to be the guardian at the outlet of the bladder. But Hyrtl's explanation of the action of the sphincter furnishes an explanation of this apparent contradiction. He compares the action of the detrusor upon the sphincter to the effect of a finger opening the string of a tobacco-pouch. It is therefore only when the detrusor contracts that the sphincter begins to relax. If the contracting power of the detrusor is held in abeyance by atropia, there is no occasion for the action of the sphincter vesicæ at all, and the result appears to be in accordance with our clinical experience.

It is unnecessary to administer atropia during the day, because the paralyzing effect upon the bladder is required only

at night in cases of enuresis nocturna. It is my practice, therefore, to order a sufficient quantity of atropia in the afternoon at four, and at bedtime, seven o'clock, to *insure a dilatation of the pupil*. One sixty-fourth of a grain for children from six to ten, and double the quantity for children up to fourteen, administered at these hours, usually suffices. If the pupils are widely dilated when the next dose is due it is omitted. Thus poisonous effects have been prevented, and the children were able to continue in their usual routine life. The essential principle of this treatment must be clearly impressed upon the parent or attendant,—viz., *the pupil must be dilated during the sleeping hours*, as an indication that the system is under the influence of atropia.

I regret that I cannot give you statistical notes of my cases in private practice, but that I have obtained the best results from this treatment I may assure you. I have recently introduced the systematic administration of atropia in the New York Juvenile Asylum, and while my investigations are not yet completed, I desire to offer you the results of the treatment up to the present time. Unfortunately, the records in the girls' ward were so imperfect that I cannot utilize them. Sixty boys received from one sixty-fourth to one thirty-second grain of atropia daily, dilatation of the pupil being secured in every instance but two. Although these boys had been occupants of the wet-bed ward for periods ranging from three months to as many years, the result was that after treatment was commenced, five wet the bed only once more, seven twice, five three times, four four times, one six times, one seven times, one eight times, and two nine times. Of this number sixteen wet the bed on the last day of the report. The remainder of the entire number—viz., *twenty-nine—ceased wetting the bed* after taking the first dose of atropine, and have continued free from the infirmity while under treatment. It is my intention to continue the investigations and to report the results at some future time.

In the mean time we may feel encouraged by results obtained by systematic atropine treatment carried to its full effect upon the system.

A FEVER STUDY.

*Clinical Lecture.*BY JOHN M. KEATING, M.D.,
of Philadelphia.

Reported by WILLIAM H. MORRISON, M.D.

GENTLEMEN,—Practical matters in connection with the study of diseases of children are always of great interest to us, and especially so when we are confronted with a puzzling case at the bedside. Now, probably one reason that the study of pediatrics is so fascinating to the medical profession is because of the numerous difficulties that one constantly encounters in connection with the subject of diagnosis and the feeling that so much rests upon the knowledge and the sagacity of the physician. The little patient being totally unable to explain its feelings, and the reflex phenomena being so constant an accompaniment of almost all the affections of childhood, one has to depend upon his own wits to arrive at a proper recognition of the relation between cause and effect.

A few days ago a case came to my notice which serves as an excellent example of the difficulties one encounters and of the care which should be taken both in regard to the expression of an opinion and also in regard to the treatment of acute disease. I was asked by a medical friend to see a child of his who had been ailing for several days, though presenting no marked evidences of serious illness; but when he placed a thermometer in the mouth he found, to his surprise, that the temperature was 102.2° F. At the same time there did not seem to be any cause for this, so far as his own investigation could determine. *The patient was a little girl, ten years of age, whom I had attended for several years. The family history was a good one. The child had passed through almost all of the exanthemata, was a bright, vivacious girl, of a highly-nervous disposition, ready at a moment to enter into a discussion of all the

little pains and aches which might at the time being present themselves, and exaggerate them into symptoms that might possibly mislead one who was not familiar with dispositions of this sort; but yet, when I examined her, she was found free from anything but fever that could be looked upon as a symptom of disease.

The skin did not feel very hot, and the pulse was rather slow. I shall speak more of this hereafter. At my first visit the pulse was not more than 96 per minute, and did not seem to be influenced by the febrile activity. The child's mind was perfectly clear. The face was not flushed. In fact, she complained of being obliged to stay in bed when she felt so unusually well. A stranger coming in to see the child would never for a moment imagine that the temperature at that time in the mouth, the axilla, the rectum, and the groin ranged from 103° to 103.6° . She had complained of some stiffness and soreness in the region of the left scapula, which seemed to be slightly increased by moving the arm. That was practically the only symptom. The tongue was free from any coating, and was normal in appearance,—not very red, nor was it flabby. The breath was not at all offensive. There was no cough and no shortness of breath. The lungs were free from disease, not even giving the signs of a slight bronchitis. The throat was as normal as a child's throat could be. It was unusually free from any enlargement of the tonsils, which is so common in this latitude. The heart's action was slow, the pulse perfectly normal and regular, the heart-sounds absolutely free from murmur, and to this I gave particular attention, for reasons that will appear in a moment. The urine was abundant, limpid, and absolutely normal. There was no trace of albumen. The bowels had a tendency rather to constipation, but when moved the stools were normal in appearance. The appetite was excellent, and the child craved food. There was no special thirst, and the mucous membranes did not appear to be at all affected by the temperature. There was no eruption upon the skin anywhere. There was no tenderness in the right iliac fossa and there was no enlargement of the spleen. There had been no nose-bleed. There was no unusual tympany. The liver dulness was normal and there was no tenderness in the

hepatic region. The feet were rather cold. The child was reported by its mother as sleeping well, to have no delirium or undue restlessness, and no mental excitement of any kind. The only thing which she had noticed—and this frequently attracted her attention—was occasional flushing of the face. This seemed to be due to vaso-motor disturbance, as it would come and go independently of any outside disturbing influence. There was no vomiting, and, in fact, until the temperature was taken, scarcely any sign of disorder, with the exception of the occasional flushing, had been noted.

The family is undoubtedly a rheumatic one. The history which I received, and, in fact, which I had known before, having been in attendance on other occasions, rather led me to suppose that in this child a very slight disturbance would produce a tendency to very high temperature, a peculiarity inherited from its mother; but as the little one had a history of exposure to damp weather going to school, had complained on several occasions of pains in the bones and of a slight feeling of muscular fatigue, I concluded that possibly the case was one of those masked cases of rheumatism in childhood the study of which has been so much neglected, and which are undoubtedly more common than one would believe from a study of medical literature.

The child was placed upon treatment in accordance with this view. The treatment consisted of the following:

R Acidi salicylici, grs. xii;
 Potassii bicarb., ℥j.
 Ft. pulv. no. vi.

Sig.—Dissolve one powder in water, add a small quantity of either lemon- or orange-juice, and take every third hour.

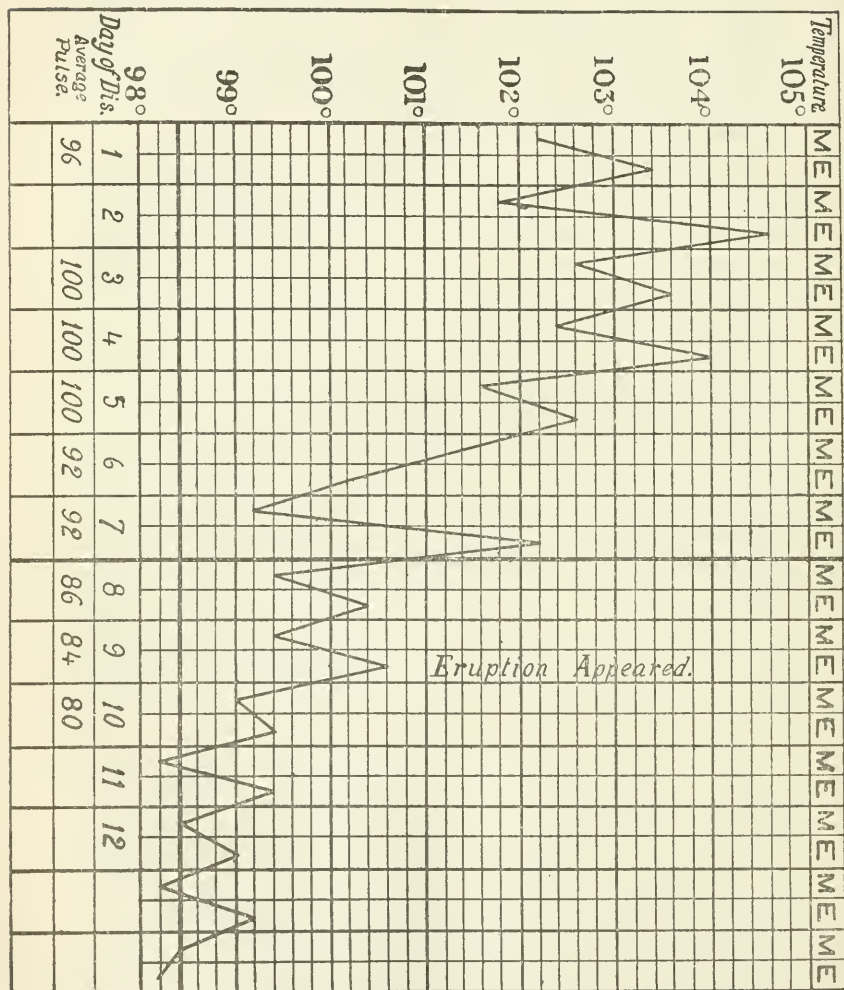
In addition to this, salicylate of soda was given at night when there was any rise in temperature. It will be seen, from the temperature record here presented, that there was a rise towards evening, and a very considerable one. The little one was sponged two or three times a day with alcohol and water. The diet consisted of milk with Celestine Vichy water, a small quantity of chicken-broth and wine whey in claret-glassful doses three or four times a day. The child was

permitted to drink freely of Buffalo lithia water, and occasionally during the day a tablespoonful of Murray's fluid magnesia was given, with the hope of a gentle laxative effect. At night the child was given sweet spirits of nitre to drink in water, should it be thirsty. Cloths saturated with camphor-water were applied to the head, and the feet were put in mustard and water. This latter measure was objected to, and was abandoned after the first application. The treatment was, in fact, altogether an expectant one.

What was this case? Was it a case of rheumatism? Was it a case of typhoid fever? Was it a case of remittent fever, and, if the latter, could it be of malarial origin? It will be seen, from the temperature chart, that the latter view had many points in its favor. The theory of rheumatism was soon abandoned, as the child complained no more of pain or even of soreness, and yet the temperature continued to exhibit this peculiar range. The treatment had very little effect in modifying it, and it was thought advisable, when the thermometer recorded a temperature of 104° , that something should be done to prevent the unfavorable action of persistent high temperature. The child was then placed on antipyrin in three-grain doses, to be repeated in the course of an hour or two, if necessary. One dose was given at 9.45 P.M., when the temperature reached 103.4° . By ten o'clock the skin was cooler, and the child slept well. Towards three in the morning the heat began gradually to return. The skin became dry and the child complained slightly of the shoulder.

As the disease progressed the tongue became slightly coated in the centre with a brownish coat, the lips became rather dry, but no râles appeared in the lungs. There was little tympany, and obstinate constipation. The child had not the appearance of typhoid fever, but yet there was something sufficiently suspicious about the case; and recognizing the amount of typhoid that had been present in the city, the slowness of the pulse out of all proportion to the temperature, and the history of previous cases that I have myself had, rather led me to suspect that this was going to be a case of typhoid fever. On this account the child was carefully examined for spots, not only on the abdomen, but over the chest, the back, and the arms,

where the rose-colored spots of typhoid usually appear, but not the least suspicion of one could be found, or anything that looked like one. The skin was clear and absolutely free from any evidence of an eruption of any kind. There was not the



slightest tenderness or gurgling over the right iliac fossa. There was no enlargement of the spleen, no hebetude, no bronchitis, no nose-bleed. The movements of the bowel, which took place every two or three days, and then followed

the use of an enema, were not characteristic of typhoid fever. We hesitated to give any purgative; but, as the tongue became slightly coated, it was thought advisable to administer broken doses of calomel (one-twelfth of a grain) with soda and ipecac. This was given occasionally during the day, and followed by a dose of castor oil, and finally by an enema. The result was a movement of the bowels practically normal in appearance, containing a few scybala at first which had probably remained in the rectum for some time, but the passage from the upper portion of the bowel failed to show any evidence of disease. The peculiarity of the temperature on the fourth day was an occasional tendency to a higher morning temperature than an evening one, and this extraordinary irregularity was commented upon; yet the uncertainty of the cause made us hesitate in using any more powerful means of bringing the temperature down to normal. After the fourth day quinine was substituted for the antipyrin, and the evening dose, given about one hour before the time at which the temperature was expected to rise,—that is, about four o'clock,—was five grains of the bisulphate. This was associated with three grains, given early in the morning. After the fourth day the temperature did not reach a higher point than 102.2°. The pulse gradually became slower and developed an irregularity and intermittency which was rather peculiar. There was a marked intermittency every fourth or fifth beat, and yet the cardiac sounds were perfectly normal. There was inequality of the rhythm in its strength. In fact, it was a pulse which made us hesitate in giving large doses of quinine, and especially large doses of antipyrin. My experience with antipyrin in diseases of childhood has been a very satisfactory one, especially where I have used it in association with alcohol. It will at once reduce the temperature, and I know of no better antipyretic; but at the same time I am always afraid of reducing the temperature suddenly in children where the cause of the high temperature is unknown, and in this case there was certainly a degree of uncertainty which made me hesitate all the more. I felt, as I examined the child's heart and pulse, that this peculiar irregularity and intermittency was not due to the high temperature. In fact, the slower the pulse became the

more irregular it was. It was more irregular when it was down to 80 or 86 with a temperature of 100° than it was when it was 98 with a temperature of 102.2°, or 104 with a temperature of 104°. The pulse became more regular as the temperature advanced, and the heart seemed stimulated to its work by some irritative influence. On this account I thought it advisable to use coffee as a stimulant, and the child was given a bowl of hot milk flavored with coffee as her breakfast in the morning, which she relished. I have given all of these points and doubts in connection with the diagnosis simply because this case affords a most excellent clinical study.

On March 1—that is to say, on the ninth day of the illness—two marked vesicles of chicken-pox appeared on the thigh, and from that day the temperature was reduced, became more regular and normal, and the child rapidly progressed towards convalescence, as will be seen by the temperature record.

Before this child was taken sick, a younger brother had a quite severe attack of chicken-pox, and about a week later, while my patient was being seen, a baby of six months exhibited intense nervous symptoms, and a warm bath brought out a free eruption of chicken-pox. Now, whether the case which I have narrated was one of suppressed varicella or not, is a question on which I am yet undecided. Nevertheless, the curious coincidence of the extraordinary range of temperature, the irritability of the nervous system, the absence of typhoid symptoms, the want of any conclusive evidence to establish the diagnosis of a malarial origin, and the rapid re-establishment of the equilibrium of the circulation and nervous system upon the appearance of the eruption, are all subjects of intense interest and certainly point to the diagnosis of suppressed varicella or, in other words, to the appearance of varicella in a child older than the usual run of cases. It is also an illustration of the importance of the expectant plan of treatment, for I firmly believe that if this child had been injudiciously exposed to any violent measures of treatment, such as cold douches, large doses of antipyretics, active, energetic knocking down of the temperature, we might, as a consequence, have had a very serious result, which could have been attributed to anything else but the true cause.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Rotch: Observations on the Usual Methods Employed for modifying the Albuminoids of Milk in Infant Feeding. (*Boston Med. and Surg. Journal*, February 7, 1889.)

The author has been making some experiments with the coagulum of human and cow's milk, which lead him to believe that the views concerning the various diluents and attenuants used in modifying the albuminoids in cow's milk are not only theoretical, but incorrect.

The total amount of nitrogenous matters in human milk is from one to two per cent., and in cow's milk about four per cent.; a portion of this is coagulable, and a part of this coagulable portion consists of a chemical combination called casein; the non-coagulable portion in human milk is greater than in cow's milk; the reverse of this is true of the nitrogenous portions of cow's milk. This difference in coagulable quality has induced observers to attempt to break up the larger curd of cow's milk with diluents and attenuants; but the author believes that, since these nitrogenous matters are two to four times as great in cow's milk as in human milk, it is more practical to dilute these matters until the dilution corresponds to that found in human milk, when the coagulum will be found to correspond to that of human milk, and will not require to be broken up.

It is claimed that the curd of human milk is small, soft, and friable, and that of cow's milk is large, tough, and tenacious; but the author has found that where the percentage of albuminoids in human milk reaches that in cow's milk the curd resembles that of cow's milk; in support of this he reports the case of a wet-nurse whose milk, on the plain food to which she had been accustomed, contained 2.53 per cent. of albuminoids; after a three-weeks' diet of greater amount and richer quality, with less exercise, the percentage increased to 4.61, and the nursing vomited thick curds; but on a return to plainer food and skimmed milk, the percentage dropped to 2.9, and the babe ceased vomiting. He claims that this case contradicts the views of certain German authors, that the high percentage of albuminoids in cow's milk can be digested if the milk be sterilized; also, that this case points towards simple dilution with water as the most practical way of managing a thick,

tenacious curd; since by increased water in the wet-nurse's milk, and not by alkaline diluent or cereal attenuant, the curd was rendered more digestible.

The author gives in detail ten experiments with cow's milk twenty-four hours old; each treated differently by boiling, sterilizing, adding lime-water, barley-water, etc., and then digesting artificially; in nine, curds were found of different sizes, the largest being in raw, boiled, and sterilized milk, the size decreasing as the proportion of diluent was increased, until in the tenth, in which the proportion was one part milk and five parts plain water, no curd was found,—in this respect resembling woman's milk tested at the same time. These results were verified by competent observers, and show that a diluent is of service, not so much for any particular chemical quality or ingredient it may contain, as for its power of diluting the milk.

As it has been claimed that cereal attenuants retard the curdling of milk, by getting between the particles of the coagulum, the author experimented with Mellin's food, Imperial Granum, powdered crackers, etc., and compared the results with the hot water and milk of his former experiments. In none was the curd as fine or its formation any slower, and its size depended upon the percentage of starch present.

Larrabee: On the Management of Fevers in Childhood. (*Jour. Am. Med. Association*, January 26, 1889.)

Fever may occur either by an increase in heat-production or a prevention of its dissipation, and is due to irritation of those nerve-centres in the brain and spinal cord which preside over calorification. Whatever the cause, the process is the same in each case, and denotes a resistance on the part of the economy towards its enemies.

The fevers of childhood are sudden and short, and, aside from complications, tend to recovery. The majority are symptomatic, and subside on removal of the cause. The most frequent causes are of internal origin. It is not sufficient to have absolutely sanitary dwellings, but the body also should receive proper attention. Recognizing this fact, the chief treatment of child fever consists essentially in prophylaxis, obtained by abundance of fresh air, antithermic rather than a pyretic medication, regulation of diet, daily ablutions of the whole body, forced dilutions by frequent draughts of water, and very little medicine, which should be restricted to the indications of nature in disease.

The author then enters into a lengthy discussion regarding the identity of remittent and typhoid fever in childhood; the

summary of his observations being that remittent, so called, and typhoid fever in the child are synonymous. He quotes many authorities in support of this view, and advises striking the name remittent fever from the nosology of children's diseases. He believes that "childhood is a period of life requiring the greatest amount of knowledge and the least amount of medicine," consequently he prefers to speak of the "management" rather than the "treatment" of child fever. He refers to the usual requirements,—a large airy room, ventilation, sunlight, diet, plenty of water, etc.,—and then gives his routine in the beginning of all fevers,—*ipecac.* and warm water to evacuate the stomach, hourly doses of one-tenth grain calomel for twenty-four hours, a warm soap-and-water bath, and clean body and bed-linen. This occupies two days, but, if well done, one-third of the cure has been effected; or, if a simple fever be present, the entire cure. If the fever continues, and there is doubt whether it be malarial or typhoid, the author gives *muriate of quinine* in *muriatic acid* and syrup of orange. If this fails to control the fever, malaria may be left out of the diagnosis, and the quinine should be stopped and not given again until convalescence calls for its tonic action. Instead, the patient should take water containing dilute *muriatic acid*, sipping it through a bent tube, and, if there be restlessness, the fever-coil should be applied to the head. Do not urge food, but frequent draughts of water, and with this small doses of *morphine* or *opium*, which stimulate the brain and support the nervous system better than food, and also increase the elimination of *urea*; hence the author claims that when symptoms of restlessness or delirium are present in typhoid fever there is no medicine equal to very small doses of *Tully's powder*.

Referring to the reduction of temperature in fever, he is strongly opposed to the cold-pack. As he expressed it, driving the heat from the surface does not reduce the temperature of the blood any more than surrounding a fire by a brick wall reduces the heat in the furnace. The use of the cold-pack must necessarily produce internal congestions, and he doubts that such complications as *bronchitis* and *pneumonia*, occurring under such circumstances, are entirely independent. He uses the warm bath, preferably in the evening; and in those too ill to be removed from the bed, the warm wet-pack. He asserts that the benefit from this moist heat is so great that an *anodyne* will be unnecessary.

Of drugs he prefers *antipyrin* to *aconite*, *gelsemium*, or *veratrum*. It reduces the temperature, allays pain, and quiets reflexes. In gastric or fermentative fevers and in the

several forms of typhoid he has obtained the finest results from Deplat's phenate of ammonia.

Regarding alcohol, he claims that it is a food only in the most restricted sense. As a stimulant it is often needed, and he so uses it; but he has never seen a child fever treated with alcohol which could not have been better treated without it. When diluted with water and sponged over the naked body it is beneficial in the abstraction of heat, and delightfully refreshing.

The author has never seen any good result from forced feeding; he believes in a more careful study into the provisions of nature, and humoring the appetite. He offers a limited quantity of milk, preferably buttermilk or skimmed milk; if not willingly taken, wait. Beef-tea he will have nothing to do with; he says five grains of nitrate of ammonia in a tumbler of water discounts beef-tea. He advocates an abundance of salt, to promote cell-activity and osmosis. He gives Mellin's food with milk and barley-water; he says it is relished and easily digested.

He enjoins absolute rest, even in convalescence, as exercise or exertion may cause sudden death from cardiac failure. In the stage of convalescence a good tonic is required,—air, exercise, and diet are the best,—but to aid these he has found nothing to equal citrate of iron and ammonia with infusion of columbo.

Descroizilles: Terpine in the Bronchitis of Children. (*Jour. de Méd.*, December 23, 1888.)

This substance may be used in the form of elixir, wine, pastils, or paste, in doses of ten to sixty centigrammes daily, for children from six to ten years of age. It may be used with advantage in place of terebinthine. The taste of terpine is much less disagreeable than that of terebinthine or turpentine, and it may therefore be made acceptable to small children who will obstinately refuse to take turpentine. In children six or eight years of age it may be given in doses of fifty to sixty centigrammes daily without causing repugnance or gastro-intestinal perturbation.

A. F. C.

Bouchard: Camphorated Naphthol and Camphorated Phenols. (*Le Concours Méd.*, January 12, 1889.)

The author has been using for some time at the Hôtel Lariboisière an antiseptic liquid composed of one part of naphthol and two of camphor triturated together dry. The great antiseptic property of naphthol and its superiority over other antiseptics which may be more energetic, but are also much

more poisonous, like the salts of mercury, for example, have been well shown by the author. This property of naphthol suggested its combination with camphor for topical antiseptic purposes, and the results are that under its use excoriations, wounds, and ulcerations heal with great rapidity. This preparation and camphorated phenol were also used in several cases of diphtheria, to destroy false membranes. The camphorated phenol is very painful, however, while the camphorated naphthol is not. The mixture is composed of one part of pulverized *B*-naphthol and two parts of powdered camphor. This should be triturated until a liquid results. Audoucet has experimented to see if camphor would have the same liquefying effect upon other substances as it has upon naphthol. He found that it would combine with resorcin, salol, thymol, and pyrogallol, in from one to five to one to twenty-five making a soft paste. If the quantity of camphor were increased a syrupy liquid would be obtained which would mix readily with oils, lard, and vaseline, which is soluble in alcohol and ether and insoluble in water.

A. F. C.

Whitelegge: The Period of Infection in Scarlet Fever. (*Lancet*, January 5, 1889.)

The author believes that there are two periods when the disease is specially likely to be conveyed. First, during the acute symptoms of the first few days; and, secondly, during active desquamation. During the intervening period the likelihood of contagion is much less.

Among seventeen hundred cases, of which exact particulars were at hand, there were two hundred and eighty-eight households in which two or more cases occurred. Neglecting all third or later cases there remained two hundred and eighty-eight pairs of cases. The following table shows the relative frequency of interval between the cases. The day of the attack being reckoned as day 1; the next day as 2, etc. Thus there were on day 1, besides the two hundred and eighty-eight first cases, also sixteen second cases; on day 2, forty-two second cases, etc., as follows in the table:

		Second Cases.			Second Cases.			Second Cases.
Day	1.....	16	Day	11.....	5	Day	21.....	5
"	2.....	42	"	12.....	5	"	22.....	2
"	3.....	30	"	13.....	5	"	23.....	1
"	4.....	19	"	14.....	6	"	24.....	0
"	5.....	21	"	15.....	10	"	25.....	1
"	6.....	17	"	16.....	11	"	26.....	3
"	7.....	18	"	17.....	5	"	27.....	1
"	8.....	18	"	18.....	3	"	28.....	0
"	9.....	6	"	19.....	3	"	29.....	3
"	10.....	6	"	20.....	2	"	30.....	1

Second cases occurring in the same family on day 1 or day 2 are presumably due to some other cause than infection from the primary case.

The attention is called especially to the sudden drop in the ninth day and the marked rise again on the fifteenth and sixteenth.

Third cases in families are excluded, as it would be impossible to tell to which of the previous cases they should be referred.

Cooper: *Scarlatina and its Relation to Cow's Milk at Wimbledon and Merton.* (*Lancet*, January 5, 1889.)

In a paper read before the Epidemiological Society of London the author states that in a given district five hundred and ninety-two cases of the disease occurred within two weeks. The only thing that was peculiar to this district and common to its families was the milk supply. Mr. W. H. Power examined the herd which supplied the milk and found some animals suffering from a disease of the udder similar to that which Dr. Klein had described as occurring in the well-known cases of the Hendon cows. An idea of the incubation of the disease may be obtained from the fact that seventy-four per cent. of the cases occurred within two days of the stoppage of the milk. This period of two days was one which seemed to prevail throughout the epidemic, since there was quite a number of persons who partook of the milk only on certain days, two days after which an exacerbation in the number of cases always occurred. In the writer's mind there is no doubt as to the direct connection between the disease in the cows and the outbreak of scarlatina.

Eruptive Diseases of the Teats and Udders of Cows in Relation to Scarlet Fever in Man. (*Lancet*, December 1, 1888.)

The report of Professor Brown to the Agricultural Department upon this subject revives a controversy which was carried on with much vigor during 1887. The memorable inquiry conducted by Mr. Power and Dr. Klein in 1885-86 resulted in an apparently conclusive demonstration that an epidemic of scarlet fever had originated in an eruptive disease upon the teats and udders of cows in a dairy farm at Hendon. A micro-organism was found in the ulcers which was believed to be identical with that found in scarlatinal blood.

During 1887-88 no less than eleven outbreaks of udder disease were carefully observed, one of them being upon the same farm at Hendon. In some instances observations were

made day by day for several months. These are declared by the report to have precisely the same characters as the "Hendon cow disease." The affection was communicable to the hands of the milkers and to the nose and mouth of calves sucking the cows. It was not, however, communicated to consumers of the milk, nor was there in any instance an epidemic of scarlet fever. A disease among cows is described at Edinburgh, coincident with an outbreak of sore throat among consumers of the milk. An examination of nine thousand cows about London failed to reveal a single case of udder disease, although scarlet fever was very prevalent at the time. Careful researches show that udder disease and scarlet fever have seldom coexisted, not more often, indeed, than could be explained by coincidence. As a matter of fact, the theory of cow infection rests mainly upon the single outbreak at Hendon in 1885-86, that being the only one which had seemed to stand the test of scientific investigation.

Professor Brown concludes that the Hendon disease was not an isolated outbreak, confined to a single farm, but was going on at the same time in several other places, the source of infection being identical,—the introduction of cows from the same Derby herd. Scarlet fever was coincident with the distribution of milk from the Hendon cows only. There was a possible source of infection of this milk by human agency. There were cases of scarlet fever at a short distance from the farm, with constant communication between the infected dwellings and the dairy.

The pathological and experimental investigations were conducted by Professor Crookshank. Scarlatina could not be communicated to calves by feeding with scarlatinal products or by inoculation with the blood of scarlatinal patients. It was demonstrated that lesions induced by inoculation with microbes cultivated from scarlatinal blood are not to be distinguished from those met with in septic poisoning. It is contended that the so-called scarlatinal organisms are forms of *streptococcus pyogenes*.

The report further contains several records of outbreaks of scarlet fever when milk was suspected in which no cause could be determined, unless the disease originated from the cows. The question is therefore still left in an unsettled state, the only positive conclusion being that the danger of milk infection through disease of the cow has been much exaggerated.

Russell: Scarlet Fever in Relation to a Glasgow Milk Service. (*Lancet*, December 1, 1888.)

Among three hundred and sixty-three families supplied

with milk from a special dairy, twenty-nine were affected with scarlet fever and forty-three cases resulted. There also followed in the line of the distribution of this milk a "cloud" of undefined but plainly specific illnesses of the nature of sore throat, vomiting, and diarrhoea. The milk was distributed by carriers, and from two shops. Children lived in rooms connected directly with the first shop for eight days during the stage of active desquamation, but there was no contamination of the milk. The second shop communicated with living apartments in which there were scarlet-fever patients who passed through all stages of the disease. It was from this place that the affected milk was distributed. Examination of the cows showed them undiseased.

An interesting point is the fact that the prevalence of the disease was in proportion to the amount of milk used,—those houses taking the most milk being most afflicted with the disease; the risk seeming to rise and fall with the quantity consumed. The lesson which the reporter desires to enforce is the danger arising from mixing up the milk business with family life.

Smith: Belladonna-Poisoning. (*Lancet*, September. 1, 1888.)

The child, aged four years, was in a state of complete insensibility, foaming at the mouth, and suffering from tetanic spasms and spasmodic breathing. The pupils were fully dilated. The child had swallowed some liniment, the ingredients of which were unknown by the parents. One-quarter of a grain of sulphate of morphia was injected into one arm and one-tenth of a grain of pilocarpine into the other. In about ten minutes the foaming at the mouth ceased, and soon afterwards the tetanic spasms. The breathing became quiet and normal. The pupils soon began to contract, and to all appearances the child seemed in a natural sleep, which lasted eight hours, when it sat up and vomited. The next day it seemed quite well. It was noticed that no sweating ensued from the injections, owing, it is believed, to the belladonna taken. It was learned afterwards that the child had swallowed a belladonna-and-soap liniment.

Percival: Antipyrin in Laryngismus Stridulus. (*Lancet*, November 17, 1888.)

Twenty-four cases are reported. They occurred in Tasmania during the months of April and May, and are attributed to the sudden changes of temperature, with cold, damp winds, to which that region is liable. The first case, that of

a child eighteen months old, was marked by dyspnœa, crowing inspiration, and convulsions. Treatment by ipecacuanha, sedatives, and hot applications proving of no avail, antipyrin was given in doses of two grains every hour. The dyspnœa soon ceased and the child fell asleep. The same dose was then continued every two hours. With all the other cases equally good results were obtained. It was necessary to increase the dose in some instances, according to the age of the child or the severity of the paroxysm, five grains being the maximum.

II.—MEDICINE.

Sturges, Octavius: *Etiology of Chorea.* (*Lancet*, September 29, 1888.)

The author gives an analysis with reference to the etiology of one hundred cases of chorea in children.

It is shown to be a common disorder in London, but not so everywhere. And this striking inequality of geographical distribution is in no correspondence with the variations of rheumatism. According to etiology, chorea is divided into four classes:

1. Chorea intimately connected with rheumatism.
2. Chorea in rheumatic children, but having its immediate cause in psychical disturbance.
3. Chorea in nervous children excited by some nervous cause and without rheumatism.
4. Chorea unconnected either with rheumatism or nervous shock.

The relationship between rheumatism and chorea is shown in the following table:

Family rheumatism in	25	
Personal rheumatism in	30	{ 15 near.
		{ 15 remote.
Both family and personal in	5	{ 4 near.
		{ 1 remote.

Of the sixteen cases where rheumatism is remote, nine have for immediate cause distinct nervous shock; seven have no known immediate cause. Twenty-five per cent., or one-quarter, expresses, as nearly as can be reached, the proportion of rheumatic children who get chorea, whether in immediate or in remote connection with their rheumatism.

The nervous relations of chorea may be considered from the point of view both of the individual and his inheritance. As regards the latter, it must be borne in mind that family history

goes for much less in children than in adults. Observe how meagre is the family history of the one hundred children as shown in the following table:

(a) Family neurotic connection.

Father insane in.....	1
Mother insane in.....	2
“ had chorea in.....	2
“ hysterical in.....	1
“ epileptic in.....	2 (or 1)
“ very drunken in.....	1
“ worried or mentally distressed in.....	3
Brothers or sisters had chorea in.....	3
Grandmother insane in.....	1
Aunt insane in.....	1
Uncle insane in.....	1
Aunt had chorea in.....	3
Cousin had chorea in.....	1
Family neurosis in.....	..22 (or 21)

This table shows that one hundred children taken anywhere could hardly have fewer unsound near relatives. Much the same is true of the personal histories.

(b) Personal neurotic connection.

Chorea had occurred before in.....	29
Reported as of an emotional temperament.....	26
“ as showing irritability or change of temper before attack.....	6
“ as irritable during attack.....	2
“ as complaining of headache before attack.....	8
“ as complaining of hyperæsthesia of forearm ...	1

Further research shows that of fifty-five of these children seventeen were by nature irritable and nervous or had become so by change of temper preceding attack; and twenty-five were made choreic by some special nervous disturbance. In all, forty-two. Leaving thirteen of rheumatic or unknown causation.

The result of actual computation shows that, while three-fourths of the cases are altogether apart from rheumatism, much more than one-half (nearly three-fourths) are in close connection with mental shock or overstrain. This accords with the general observation that chorea prefers the sensitive sex and the sensitive age.

Chorea has two distinct phases. It is first a disorder of the mind and afterwards a disorder of the body. In its earlier stage it needs moral correction. When the motor part of the affection becomes apparent drugs are applicable. The author points out that the mental excitement stage is largely overlooked.

In regard to the starting-place and the comparative frequency of choreic movements in different parts of the body the author's

table shows that chorea prefers the upper to the lower limbs, and that it selects the hands, one or both, rather than any other part of the body (the face excepted), for its earliest attack, while as between right and left there is no appreciable difference.

There are other points—such as shifting from one limb to another—that cannot be put in tabular form.

They point to no anatomical basis of chorea; no general expression would better convey the facts than to say that the parts which suffer first and most are the same as are used to express emotion, and subjected to the highest, longest, and most complicated training.

Altogether in the sex, age, and temperament, chorea favors in its occasions and exciting causes, in its transient paresis and nervous pains, in its complete, uneven, and practically invariable recovery, even in its modes and stages chorea seems most like hysteria.

Its essential character is an exaggeration of involuntary motility; a diminution of the power of the will; the emotional, sensational, and reflex movements are in excess; the voluntary are defective. These words of Dr. Russell Reynolds describe chorea about as well as hysteria.

The practical lesson of the paper is that chorea is the most preventable of all diseases and the most directly due to ignorance, neglect, and want of observation.

The early symptoms of altered temper, disturbed sleep, inattention, and impatience are obvious enough. This early stage is usually not merely untreated by the doctor; it is acutely aggravated by undeserved punishment.

If there were a wider knowledge of the way chorea begins much of it might be prevented.

The author believes that the system of school-work which pushes children forward at a uniform rate is a fruitful source of chorea, and that much harm and physical injury results from it.

Comby: Certain Forms of Stomatitis in Children. (*Rev. Mens. des Mal. de l'Enf.*, October, 1888.)

Seven varieties of this disease are enumerated and described, and though the disease is not one of the most grave, it is still one of considerable importance. In very young children no morbid phenomenon, however slight in appearance, must be neglected. Stomatitis may be a source of danger through the interference which it causes with alimentation, by the diarrhoea which often results from it, and by the more or less serious diseases to which it may serve as a gate of entrance.

The differential diagnosis of the several varieties of the disease is not always easy. The most superficial varieties—the erythematous and the pultaceous—are easily recognized. They are almost always associated with dentition, and have a local, mechanical, traumatic cause. They may sometimes serve as an enanthematic indication of a general disease,—mumps, for example. Mercurial stomatitis is rarely seen in children, and is distinguished by its intensity and the prominence of salivation as a symptom. Exfoliative stomatitis, or lingual desquamation, is common in early childhood, and can be recognized by the circular arrangement of the borders and the thickness of the epithelial plaques which limit the desquamative zones. With this condition are also associated a saburral condition of the tongue and muguet. With ulcerative or erosive stomatitis there may be several causes of error in making a diagnosis. The simple variety is due to caries, malformation, or laborious eruption of one or more teeth. The simple ulceration of the gums in such cases must be distinguished from the multiple ulcerations which characterize ulcero-membranous stomatitis, and which are numerous, round, covered with a grayish membranous detritus, associated with glandular engorgement, and not related in any way with the development of the teeth. Herpetic stomatitis may be isolated or accompanied with labial or guttural herpes. It may consist of eight or ten round, small erosions on the dorsum of the tongue, which, as they coalesce, form a large irregular erosion with yellowish base. The dimensions and grouping of the elements of herpetic stomatitis distinguish this variety from the ulcero-membranous, aphthous, impetiginous, and varicellous varieties. Acute impetigo, or *impetigo contagiosa*, in children may have developments upon the pituitary, ocular, vulvar, or buccal mucous membranes. In the last-mentioned form, or impetiginous stomatitis, the ulcerations may be larger and more irregular than those of herpes. They are most frequently found in the anterior portions of the buccal cavity and frequently coincide with facial impetigo and with phlyctenular or pustular conjunctivitis. Aphthous stomatitis has round, isolated ulcerations, frequently found upon the tongue and palate, and seldom larger than a lentil. They are painful, and accompany a more serious general condition than do the others.

Varicellous stomatitis differs from the other forms by the extremely superficial character of the ulcerations, which are at first covered with a white disk. The varicellous exanthema always accompanies them, and renders the diagnosis certain.

There may be prophylaxis as well as treatment for these

different varieties. The relation of several of the varieties to dentition teaches that one should carefully watch the evolution of the teeth, and remedy the imperfections of the process as far as possible. Artificial alimentation and over-feeding should also be avoided. In badly-nourished children with impending athrepsia, one should prevent or arrest the development of muguet or ulcerative stomatitis, the mouth being frequently washed with alkaline waters,—for example, lime-water or Vichy,—and a few coffee spoonfuls should be used in the course of the twenty-four hours with the milk. For ulcerative stomatitis, when well developed, a mouth-wash and an application of a five- to ten-per-cent. solution of chlorate of potash is advised. For children over three years of age one to two grains of the potash may be given by the mouth in the twenty-four hours. Instead of the potash salt a mixture may be made containing twenty grammes of glycerin and two of borax, and this may be applied to the ulcerations half a dozen times daily. If the ulcerations are extensive, they may be touched with the solid nitrate of silver, or the silver may be combined with sulphate of copper, or an application may be made of equal parts of glycerin and tincture of iodine. For the fetid breath of stomatitis the mouth may be washed with a three-per-cent. solution of boracic acid, or a one-tenth-per-cent. solution of permanganate of potash. Together with these means of local treatment one must not forget the necessity of preserving the general nutrition.

A. F. C.

Hofsten: Cholera Infantum in Stockholm. (*Arch. f. K.*, x. 1.)

The value of this report upon certain conditions in a local hospital is believed to be such that it is worthy of extensive circulation. The author refers to Benjamin Rush as the first to describe this disease (1794). Another American—Dewees—also gave a good description of the disease in 1826. The disease was recognized and studied in America before it was studied in Europe. Billard and Valleix have seen and described cholera infantum, but they have confounded it with muguet, enteritis, and other conditions. It has also been confounded with gastromalacia and hydrocephaloid. Parrot described it, under the name of athrepsia, in 1877, and Widerhofer and Baginsky have added to our knowledge of the disease since that time. Reports of the disease have been made from the foundling hospitals of Paris, Vienna, and Prague. In the General Hospital at Stockholm it was observed as early as 1815. Since the year 1842 it has been

endemic in that hospital with but short intervals. Between the years 1842 and 1858 there were seen 332 cases; between 1860 and 1882, 988 cases, and of the latter 73.5 per cent. were fatal. The disease occurred principally between the first and third years of life, especially during the first year. The greatest mortality was between the sixth and eighth months. Of the 988 patients in the author's table, 581 were boys and 407 girls. From January to March there occurred 239 cases; from April to June, 222 cases; from July to September, 352; and from October to December, 185. Of 763 nurslings, 348 were nursed at the breast, and of these 75.6 per cent. died; 88 were both nursed and bottle-fed, and of these 77.4 per cent. died; 331 were bottle-fed, and of these 79.8 per cent. died. Of the entire number of children, 61 per cent. had previously been healthy, the remainder suffered from diseases of the digestive organs, syphilis, atrophy, rhachitis, etc. The pathological anatomy of the disease was studied in connection with 376 autopsies. In most of these cases the right heart was filled with blood, the blood being dark, and the heart-tissue had undergone parenchymatous degeneration. The spleen was normal in most cases, in others it had undergone parenchymatous degeneration. The liver was infiltrated with fat in some cases, in others it had undergone fatty degeneration. The kidneys in almost all cases had undergone parenchymatous degeneration. In some cases there was embolic nephritis, uric acid infarcts, and occasionally pyelonephritis. The stomach frequently showed gastromalacia, small ulcers, or merely acute catarrh. The intestinal mucous membrane was frequently the seat of catarrhal disease, the follicles and the mesenteric glands being diseased.

Symptomatology was carefully studied in eighteen cases. In these there was contraction of the skin and loss of elasticity, vomiting was a frequent symptom, often the thirst was almost intolerable. Diarrhoea was a constant symptom, though the discharges were not always equally frequent nor of the same consistency. The diarrhoea differs from the diarrhoea of other diseases in that it has no specific sign. In fifteen cases there was blood in the faeces; during the acute stage the reaction of the faeces was usually alkaline. The form and appearance of the bacteria in the faeces are such as has been described by Baginsky. The urine is frequently diminished, its specific gravity is seldom greater than 1.020, it is acid, or less frequently alkaline or neutral. The urine was frequently drawn with the catheter. Albuminuria appeared in every case, and early also in the history of the disease. In 84.8 per cent. of cases the quantity was considerable, in the others it was less so.

In fifty per cent. of the cases there were casts. The eyes were sunken, and there was strabismus, conjunctivitis, or *fæcis cholerae*. With reference to the nervous system, the most frequent symptoms were drowsiness and coma, restlessness and crying, and tonic contractions of the muscles of the neck and the extremities. The temperature varied greatly; in forty-three per cent. there was fever, in thirty-five per cent. there was none, in the remainder the temperature was subnormal. The greatest loss of weight was from one hundred and fifty to two hundred grammes daily; in protracted cases it was from fifty to seventy-five grammes daily. The disease was frequently complicated with erythema and eczema, and with decubitus of the malleoli, the heels, and the occiput, also with lobular and lobar pneumonia. The incubation period lasts from three to four days, and there are no prodromata. The disease may break out suddenly or follow a pre-existing intestinal lesion. In sixty-one per cent. of the author's cases, in which the patients were well previous to the attack, the disease came on suddenly, in the others the attack was more gradual. Of those who were already suffering from digestive disturbances, twenty-two per cent. were attacked suddenly and twenty-nine per cent. gradually. The disease was fatal in seven hundred and thirty-four cases, and of these 3.5 per cent. died in the first twenty-four hours, and 52.5 between the second and sixth days. The greatest number of fatal cases was in the months of July, December, and March. The prognosis for twins, atrophic, and syphilitic children was very bad. The number and volume of the discharges seemed to have no direct bearing upon the prognosis. Decided alkalescence of the *fæces*, lessening of the quantity of urine, and increase of the albumen would indicate a bad prognosis. Collapse and loss of strength were also elements which made the prognosis unfavorable. The author believes the disease is infectious and of a contagious, miasmatic nature. The infectious agent is probably bacterial, and is distributed to the system from the digestive canal by way of the lymph-tracts. Three symptoms are of the greatest significance in making a diagnosis,—albuminuria, diarrhoea, and collapse. The diagnosis is made difficult,—1, when the disease runs a very acute course; 2, in choleraic diarrhoea; 3, when an acute or chronic intestinal catarrh has immediately preceded; 4, when there is congenital weakness; 5, when other acute diseases co-exist with symptoms referable to the intestinal canal. The treatment at first must be of a stimulating character. Good results were obtained with ether, camphor, champagne, cognac, coffee, and strong tea.

A one- to ten-per-cent. solution of camphor, with a suitable

menstruum, may be given hypodermically, or ether in the same way. Mustard baths at a temperature of 38° to 40° C. may also be used, but one must be careful to prevent subsequent collapse. For the disease process itself antizymotic and antibacterial remedies must be used,—for example, bismuth, naphthalin, and calomel. To quiet the pain in the intestines, the vomiting, and the diarrhœa, chloral hydrate should be used by the rectum. Treatment is uncertain at the best, and prophylaxis should chiefly be depended upon. A. F. C.

Rachford: *Etiology of Diphtheria.* (*Medical News*, February 2, 1889.)

The object of this paper is to inquire into the truth or falsity of the opinion that diphtheria is a local disease and that the constitutional symptoms are produced by poisonous materials absorbed from the local lesion.

Every diphtheritic membrane swarms with the normal bacteria of the mouth, together with septic bacteria; but, as yet, bacteriologists have failed to isolate a single micro-organism that could with certainty be claimed as the cause of the disease. Löffler, however, has discovered a bacillus, about the length of the tubercle bacillus but somewhat thicker, in the pseudo-membrane at the deepest part of the exudation, but nowhere present in the blood or tissues. The same bacillus was found in the mouths of one out of thirty healthy persons; but, as it is present in every diphtheritic membrane, and the disease has been produced by inoculating with pure cultures, the author thinks it merits careful consideration in studying the etiology of the disease.

Experimental and clinical testimony have established the fact that some bacteria in their growth in organic matter produce poisonous ptomaines, which, independent of the micro-organisms themselves, produce constitutional symptoms as profound and severe as those of diphtheria. The lesions in other portions of the body in diphtheria are as readily explained by this theory of the action of poisonous products absorbed from the local lesion as by supposing that a special diphtheritic germ grows and multiplies in the body. The experiments of Brieger with mydaliene, a ptomaine isolated from putrefying nitrogenous matter, produced symptoms similar to diphtheria; even the paralysis and heart-failure occurring during an attack of diphtheria find an analogue in the paralysis and dyspnœa of mydaliene-poisoning; so he feels justified in attributing these symptoms to the direct action on the nervous system of the poisonous chemical products which are producing the other symptoms.

The author does not believe that the symptoms of post-diphtheritic paralysis occurring two to six weeks after ptomaine absorption has ceased can be traced to their action so long after their disappearance. Nor does he believe, with Dr. Wm. H. Thomson, in a post-diphtheritic ptomaine, formed by the biological activity of the cellular elements of the body, consequent upon the extensive tissue-changes occurring during convalescence. But, rather, that this symptom is due to degenerative peripheral and central nerve-lesions, which probably have their origin in the action of the same ptomaines which produce paralysis and heart-failure during the height of the disease. The diphtheritic germ cannot live inside the body of an animal,—it is strictly an external parasite,—hence the ptomaines must be formed at the seat of the lesion. Diphtheria, then, is a purely local disease, and the constitutional symptoms are due to the absorption of the poison, and depend for their severity upon the lymphatic supply of the part first invaded: the tonsils and larynx are almost devoid of lymphatics; diphtheria affecting either of these is purely local, without constitutional symptoms; the trachea has slight lymphatic distribution and is filled with mucous glands; if the disease locates here it is attended with severe local symptoms, but mild constitutional manifestations; in nasal diphtheria the constitutional symptoms overshadow the local, but the great supply of lymphatics and blood-vessels to this region render it, of all surfaces, the best adapted for absorption.

The author believes that the cause of diphtheria is not an internal parasite, because faithful investigators have failed to find it in the blood or tissues; also that it is *aërobic*, *i.e.*, dependent upon oxygen for its existence, since it is always found where it can come in contact with the external air, and in those rare cases where found in the stomach or intestines it is upon an abraded surface, where it probably obtains its oxygen from the blood, the same as the anthrax.

Diphtheria may be complicated by the entrance, through the lymphatics and blood-vessels from the diseased surface, of septic germs, producing abscesses, ulcerative endocarditis, and the malignant form of the disease. And the chronic glandular enlargements following an attack of diphtheria depend upon this septic absorption, and not to the disease itself; consequently, second attacks are due to reinfection, and not to a latent stage of the disease.

The author bases his treatment upon these theories: thorough irrigation of the local lesion with antiseptic fluids, to wash away the poisonous alkaloids and retard the growth of the parasite; after irrigation of wounds apply an air-tight dress-

ing; remove poisonous alkaloids from the system by diuresis and diaphoresis; counteract depressing action of the poison on the heart with stimulants, and deteriorating influence on the blood with iron; keep the air of the sick-room aseptic, to prevent entrance of adventitious septic germs; cure chronic glandular enlargements, and local throat disease, if possible, or else warn patient against exposure; any serious exacerbation of symptoms in a patient with ulcer or catarrh of the stomach or intestines, who has been exposed to diphtheria, should lead to suspicion of diphtheria of these parts, and should be treated accordingly.

White: A Case of Membranous Croup. (*Lancet*, December 8, 1888.)

The case as reported was that of a boy four years old. The disease began insidiously, with complete aphonia, dyspnoea, and slight feverishness, but with none of the symptoms or sequelæ of diphtheria. On the sixth day, dyspnoea becoming alarming, tracheotomy was performed. Flakes of dirty membranes came away during several days subsequently, and the boy made a rapid and complete recovery. The speaker, while allowing that most cases of croup, especially when occurring epidemically, were diphtheritic, maintained that cases like this were not of that character. He condemned operative interference when the sole object in view was euthanasia, maintaining that death from dyspnoea is not a specially painful one. In children over two years of age, when alarming dyspnoea without great prostration supervenes, tracheotomy should always be performed.

Lee, Robert J.: Bronchitis: The Precedent Cause of Rickets. (*Lancet*, December 15, 1888.)

The author believes that, so far as information is afforded by the statistical method of inquiry, the precedent cause which most constantly recurs is some form of pulmonary disease, generally indicated by the term "bronchitis," the history being one of cough, difficulty of respiration, and the like. Upon examination there is found some form of pulmonary disorder, indicated by râles, crepitations, or some other sign of morbid condition. This is of such character as to lead to the inference that it has existed for some length of time, and may therefore be fairly regarded as having played a more or less important part as a causative agent. Of more value are the cases which have been under observation during the period of evolution of the rickets. It is from the study of these that he is led to think that rickets is a disease which is due principally,

if not entirely, to any cause which interferes with the functions of respiration; the precedent causes, therefore, usually being bronchitis, broncho-pneumonia, or pneumonia.

A table of fifty cases of rickets is submitted, the ages of the patients ranging from eleven months to three and one-half years. Every case gives a history of cough, bronchitis, or difficult respiration, at some period of its life, more or less remote. No data are given concerning family history, methods of feeding, or any other matter. While no summary of the trouble is given, it seems to show simply that respiratory disorders are commonly found accompanying rickets, and are, perhaps, among the causes of that disease. It does not show that "the disease is due principally, if not entirely, to any cause which interferes with the function of respiration."

[The association of bronchitis and rickets in many cases is well known and appreciated; but it seems to us that the author in the paper has not given sufficient reasons for our abandoning the position generally held, that it is the rickets which is the essential primary disease, bronchitis being a complication to which these patients are especially liable.—REP.]

III.—SURGERY.

Barwell, Richard: *Inexpensive and Efficient Support for the Head in Caries of the Cervical Spine.* (*Lancet*, December 15, 1888.)

It sometimes happens that a patient is presented for treatment with the neck in such a condition that it is highly desirable to apply immediately a support to the head. The expense of the ordinary apparatus is sometimes greater than the patient can afford. In either case a cheap and efficient support, which can be quickly applied, is of the utmost value. The following has proved by experience admirably to fulfil the requirements.

A pattern must first be cut in brown paper. A piece of paper, eighteen inches by twelve, is laid, with the long axis transverse, on the neck and upper part of the chest, in such way that when it is pressed in at the throat and under the jaw its upper anterior edge projects an inch beyond the chin. The paper is cut in a concave line from the condyle of the jaw downward along its ramus, by the side of the throat, well outside the thyroid cartilage, to a point just above the clavicle, and about a third its length outside its joint with the sternum. These cuts being completed on each side, permit the flaps of paper that lie outside them to be folded back over the shoulders

and scapulæ in such way that they meet on the spine between those bones. The rest is mere shaping. The part that protrudes beyond the chin and jaw can be cut away to a level with those parts. The inner edges of the shoulder-flaps must be cut out enough to allow room for the neck. The parts which on each side project beyond the shoulders can be cut away, leaving a concave edge with the centre of the curve upon the acromion.

By this pattern a piece of paraplastic felt is cut, which, when softened by heat, is moulded on the patient, partly by hand-pressure, partly by bandage. It may be placed upon the child at once, a small piece of wadding being placed between the chin-support and the face. To each upper end of this fork-shaped chin-plate two straps are to be sewed, one to pass around the neck, the other over the vertex. To prevent slipping these may be bound together by a tape running in the line of the sagittal suture. Behind, the edges of the felt should run parallel with the spinal column, but not quite in contact. Perforations should be made along the edges and the whole appliance laced on.

In exceptional cases the head, instead of falling forward, has a backward inclination. This may be met by placing the paper on the back and forming an occipital instead of a maxillary plate, and letting the edges meet over the sternum, where the lacing is applied.

Hamilton: Intestinal Obstruction due to Meckle's Diverticulum. (*Lancet*, October 6, 1888.)

CASE I. was a boy, aged six years, who was suffering from symptoms of very acute intestinal obstruction. The boy was apparently in his usual health the previous evening, although he had had no movement for four days. During the night he had suffered from severe pain and vomiting. He was in a condition of severe collapse, the tongue being dry, the pulse weak and rapid, and the temperature 98.4° . The vomited matter had become stercoraceous. No distended intestine could be made out, even with the aid of an anæsthetic.

An incision four inches in length was made in the median line, from immediately below the umbilicus downward. On opening the peritoneum it was noticed that there was a deeply-congested portion of intestine that ran downward into the pelvis and was constricted by a band which crossed more or less transversely. This was found to be Meckle's diverticulum, which was about three inches in length, and had become attached to the mesentery behind, close to the spine.

The diverticulum sprang from the ileum, two feet from the

ileo-cæcal valve. A loop of about two feet of small intestine was firmly constricted by the diverticulum.

The attachment of the extremity of the diverticulum was ligatured with catgut in two places and divided. The diverticulum itself was not removed. The patient made an uninterrupted recovery.

CASE II. was a boy of the same age and in much the same condition. On the fourth day there was much abdominal pain and tympanites. There was copious vomiting; no fecal odor. It was not until the seventh day that it was thought advisable to operate.

The abdomen was opened by an incision four inches in length below the umbilicus. The intestine was found adherent to the anterior abdominal wall. The operation was not completed because of the boy becoming suddenly pulseless. He died in six hours.

After death the portion of intestine which had been adherent to the anterior abdominal wall was found to be really the club-shaped and dilated extremity of Meckle's diverticulum, round the neck of which two and one-half feet of the ileum had become twisted. The diverticulum was found to spring from the ileum three feet from the ileo-cæcal valve.

Bresgen: Origin, Significance, and Treatment of Deviations and Hard Thickenings of the Nasal Wall. (*Arch. f. K.*, x. 1.)

Reference is made to the statement of Welcker, that the lower portion of the nasal opening in skulls which have irregularly-disposed nasal bones is asymmetrical. According to the author's own experience, the deeply-excavated nasal cavity always corresponds to that side towards which the cartilaginous nasal wall is bent. The fact to which Ziem has called attention, that there is abnormal development of the face and cranium in young animals in which there has been simple closure of one side of the nose, makes it conceivable that there may be asymmetry if the nasal wall of the supports of the portions of the upper jaw and the base of the skull which develop in a direction towards each other be broken, cracked, or forced out of its groove in the nasal floor. In many cases of bending of the nasal wall the history of the patients shows injury in early life; in other cases there are faults of development or inherited peculiarities. The author was unable to discover a relation between the deformities of the nasal wall and rachitis, and, in like manner, dependence of the former upon chronic and extensive swellings of the nasal mucous membrane was very unusual, if it occurred at all. The fre-

quently-observed fact that deviation of the nose is usually to the left side is explained by the statement that, as the right half of the body is usually the more perfectly developed, a child in falling will have a tendency to fall to the left side. Together with deviation of the nasal wall one usually finds some abnormality of the hard palate, possibly imperfect development of the alveolar process. If the latter obtains, there will probably be irregular setting of the teeth, especially the front ones, and with asymmetry of the nose and face possible asthenopia, strabismus, and astigmatism. Among the ills which may arise from bending or thickening of the nasal wall, in addition to the troubles caused by stenosis, rhinitis, etc., are the so-called reflex phenomena. The greater the obstruction the earlier do such troubles come. In examining noses with these troubles a few drops of a ten-per-cent. solution of cocaine instilled into the nostril will be of great assistance. Projecting portions of bone should be nipped off; cartilaginous excrescences may be cauterized with chromic acid. The latter in a twenty- to forty-per-cent. solution will also be useful to relieve extensive swelling of the mucous membrane.

A. F. C.

Pieniazek: Secondary Attacks of Suffocation in connection with Croup after Tracheotomy. (*Arch. f. K.*, Bd. x. H. 1.)

True laryngeal croup is, as a rule, a fatal disease. Cases in which suffocation does not occur, or in which as suffocation comes on the greater portion of the membrane is vomited forth and does not reform, are exceptions. By means of the various emetics and inhalation substances perhaps five per cent. of children with croup are saved. Since the introduction of tracheotomy from twenty-five to thirty per cent. have been saved by that means. All the others die, whether tracheotomy has been done or not, either from adynamia caused by diphtheritic infection or from suffocation. Adynamia with secondary dyspnoea of a threatening, possibly fatal, character may also occur. The means which have heretofore been in use for treating these conditions have been,—for the adynamia, roborants and excitants; for the fever, febrifuges. The secondary dyspnoea is obviated, as far as possible, with the drying of the tracheal secretion by suitable inhalations, and by agents to excite coughing and expulsion of the false membrane when suffocation is imminent. Coughing may often be excited by irritating the trachea with a feather. Other means for relieving the dyspnoea are tubage and aspiration, a flexible catheter being used for the latter operation, which it may be

necessary to leave for some time in the trachea or bronchi. The author has also found it useful, when attacks of secondary dyspnoea came on, to remove the offending bodies, whether membrane or exudate, through the laryngeal wound with Schrötter's forceps. For the purpose of making a diagnosis as to the location and character of bodies causing tracheal stenosis the author has been in the habit of introducing a large-sized ear speculum into the tracheal wound, by which means the trachea could be illuminated as far as its bifurcation. Examination having been made by this means, the forceps or sharp spoon could then be used for removing such substances as were susceptible of removal. In a number of cases which are narrated suffocation was prevented by the timely removal of portions of false membrane by this method, the forceps being carried even into bronchi of the second division. In some cases the relief was only temporary, fatal suffocation finally occurring; in others it was permanent, and the experience which was gained leads the author to believe that his plan of treatment is a good one. If tracheotomy alone saves thirty per cent. of children who suffer with croup, it is believed that half as many more would be saved if the treatment here described were carried out when attacks of dyspnoea occur.

A. F. C.

Arthrectomy. (*Lancet*, November 24, 1888.)

Certain questions regarding this operation are now ripe for discussion. Given a case of destructive joint-disease in which only parts of the joint are affected, is the removal of these parts only likely to be followed by a speedy recurrence of the disease in those left behind? The older surgeons would have answered in the affirmative. Arthrectomy largely rests upon the present belief that tubercular disease located in one condyle of the femur is a locally infective one, and that by removal of the diseased face the healthy parts are protected and preserved intact.

As a corollary to this comes the question, whether there is any practical advantage in leaving behind healthy portions of a joint? The evidence already accumulated is conclusive on this point. Deformity is lessened, more useful limbs are secured, and in some cases a movable joint is obtained. The value of slight range of movement in such a joint as the knee is a question on which different views are held by surgeons. The range of movement will depend upon the extent to which the disease has implicated the joint and upon the success with which aseptic wound-course can be secured.

The most important question is as to the time at which the

operation should be undertaken. Here there is room for distinct difference of opinion, and time is required to establish the best line of practice. One thing is clear: no surgeon should attempt an arthrectomy for early tubercular disease until he can practically guarantee that the joint will not become septic. The surgeon who opens a large joint to search for and remove a limited patch of tubercular disease assumes a great responsibility; but so does he who stands idly by while a limited patch of tubercle slowly but steadily spreads and involves in destruction more and more of a joint. The truth would seem to be that arthrectomy rightly employed is a great advance in the therapeutics of diseased and injured joints, but that with the advance surgeons have to sustain a greater responsibility in the care of such cases.

To sum up the whole matter:

1. Every excision of a joint should be an arthrectomy, *i.e.*, complete removal as far as possible of all diseased and injured tissues, with a minimum interference with healthy parts.

2. By a successful arthrectomy healthy parts of a joint may be preserved from disease, and thereby deformity may be prevented and function maintained.

3. Where rest and other palliative measures, carefully carried out, fail to secure a distinct improvement in a tubercular joint, early arthrectomy is advisable, as delay exposes the patient to the risk of general tubercular infection, to wider joint destruction, and to a more extensive operation at some future time.

THE SPICED PLASTER (vol. i. p. 136), an efficient local counter-irritant in many forms of gastro-intestinal catarrh, is rendered less liable to become hardened and brittle by the addition of a tenth part of powdered acacia, according to the experience of Dr. Walter Roe, of Jersey City.

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Original Communications.

CASE OF CIRRHOSIS OF LIVER WITH
SPLENIC TUMOR.*

BY MARY PUTNAM JACOBI, M.D.,
New York.

THE child that I have the honor to present to you to-night, and who is now ten years old, was first seen by me in October, 1884. She came to my clinic at the Post-Graduate School with symptoms of gastro-duodenal catarrh, accompanied by slight icterus noticeable in the conjunctiva but not elsewhere. The tongue was thickly coated, there was loss of appetite, constipation, lassitude, moderate tenderness upon pressure over the epigastrium. Unfortunately, as it proved later, the child was not undressed for complete examination, but the only symptoms complained of were accepted as covering the entire case, and treated by gray powder. This gave prompt relief, but in a week the entire cortege of symptoms returned. There was no fever.

A month after the first visit the mother of the child reported that the abdomen was enlarged. Examination was then made, and the spleen found to reach to the umbilicus. The splenic tumor was indolent to palpation. Coincidentally, the left lobe of the liver was found to be enlarged, filling all

* Read before the Section on Pediatrics, New York Academy of Medicine, April 11, 1889.

the epigastrium. Towards the end of December the child was treated by arsenic and tartrate of iron and potassa. Early in January fever occurred, being 101° under the tongue during the dispensary visit, and reported as higher at night. The jaundice returned, and there was some pain in the left side, over the splenic tumor. Five grains of quinine were administered night and morning. In the middle of January, 1885, the remittent fever was still persisting, and at the visit a temperature of 103° was found. Hemorrhagic stomatitis appeared, as, according to my notes, it had already done, during brief periods, several times. The gums were spongy and bleeding, and the lips also bled. There was no purpura. The conjunctivæ were slightly jaundiced. The child complained of no pain except slight headache, but was drowsy, and wanted to sleep all the time. Under quinine treatment these symptoms disappeared. Then, towards the end of January, the enlargement of the liver continuing the same, and icterus frequently returning, quinine was exchanged for iodide of potassium, given at first in doses of five grains, later of ten grains, three times a day, to which Fowler's solution was added. At the end of February the fever returned, to be again dissipated by quinine.

In March there was another attack of jaundice, which, however, did not seem to affect the general health. At the end of March the abdomen was more enlarged, and, for the first time, the veins of the surface appeared distended. No fluid was perceptible in the peritoneum, but the two tumors—one of the liver, the other of the spleen—were distinct, and each reached the umbilicus; one from the epigastrium, and continuous with the area of hepatic dulness, the other from the left hypochondrium, and easily traceable into the area of splenic dulness. The splenic tumor was as readily definable by palpation as by percussion.

On the 8th of April occurred another attack of jaundice, this time suffusing the skin as well as the conjunctivæ. The circumference of the abdomen was thirty-two and a quarter inches.

During the following months the child frequently spat up dark blood, though there was no return of the hemorrhagic gingivitis. The splenic tumor was the same as before. The

left lobe of the liver bulged into the epigastrium, reaching, as before, to the umbilicus; the right descended fully two inches below the border of the ribs, where it was easily appreciable by palpation. But percussion was confused by a superjacent distended colon. Iodide of potassium was resumed, while quinine was continued, in doses of two grains three times a day. The condition remained stationary until the 1st of July, when remittent fever returned, and with it appeared, for the first time, an abundant fluid effusion in the abdomen, which concealed both tumors. There was no albumen in the urine. The abdominal veins were distended, and the child suffered from dyspnœa. There was no jaundice. The child was taken into the New York Infirmity and treated for a month by purgation with the compound jalap powder, while taking at the same time iodide of potassium and iron. The ascites diminished a little. Then the child was sent for five weeks to the sea-shore, and, on return, reported as completely well. I did not see her until October, when the ascites was found to have completely disappeared, the abdomen to be soft and supple, and its circumference, which had been thirty-two and a quarter inches in April, was now only twenty-one and a half. The epigastrium tumor was much smaller, and no longer bulged. The spleen was somewhat smaller, so that its tip scarcely reached the umbilicus.

The iodide of potassium was continued at doses of a drachm a day, together with citrate of iron and quinine. This was continued through the winter. During this period the patient had frequent attacks of bleeding from the gums, but no jaundice, no fever, and has never had any return of ascites.

In February, 1886, the right lobe of the liver, which had been two inches below the border of the ribs, was now found just at their border. The spleen had suffered no further diminution since October, and it remains the same to-day.

At this time the notes cease, as well as systematic observation of the patient. I have, however, continued to see her occasionally, and found the physical signs in the abdomen unchanged, while the general health has steadily continued to improve, so much so that the child has attended school all this last winter. There have been occasional attacks, at long

intervals, of gastric catarrh, but neither jaundice, hemorrhage, nor fever until last October.

I do not think there could ever be any doubt that the fundamental basis of the entire morbid history in this case has consisted of malarial poisoning. Splenic tumor of this size may indeed be observed in leucocythæmia, or in the amyloid degeneration of syphilitic or suppurative cachexia, but for the two latter conditions the etiology, and for the former the concomitant symptoms, are equally lacking. While the child was most ill, and the disease apparently progressive, I had no opportunity to examine the blood; but a recent examination, though finding some anæmic diminution of red corpuscles, can discover not the slightest exaggeration of the white.

Birsch-Hirschfeld quotes quite a number of cases in children where the spleen became as greatly enlarged as in our case under the influence of malarial poisoning. Griesinger saw the spleen enlarged after a fever of only three weeks, so that it reached almost to the axilla above, and below, to three fingers' breadth below the ribs. In a case reported by Romberg and Henoch, the spleen, after a tertian ague, reached to the navel. In a case by Haderup, a boy of thirteen, the lower border of the spleen was felt at the spine of the ileum; but the tumor is said to have been cured by quinine. West's case was from West Africa. The child was six and a half years old; the abdomen thirty-two and a half inches in circumference; the spleen reached from the ribs to the pelvis. Steiner reports a case where the spleen was ten inches long and very solid, after only three weeks of intermittent fever.

Rathery, in his essay on the diagnosis of intra-abdominal tumors in children, remarks on the frequency with which splenic tumors appear as the result of chronic malarial poisoning. This factor is often overlooked, because the ague may have been contracted while the child had been sent away from home; often at Paris, during the first year of life, because put out to nurse in the country. One such case is related in the essay. Bouchut quotes three such cases *in extenso* where there is a double enlargement of the liver and spleen. The latter is frequently assumed to be secondary to the former and dependent on it, through obstruction offered to the portal circulation.

Thus, among seventy-eight cases of hepatic cirrhosis in children which have been collected by Howard in this country and by Laure and Honorat in France, the spleen is said to have been hypertrophied fifteen times. In the case of Sadie Hoban, however, the enlargement of the spleen began much before any enlargement of the liver was noted; it attained much larger dimensions, and it persisted after the liver had become considerably reduced in size. It seems more probable, therefore, that the lesions of the two organs were the double effect of the same cause acting upon both of them, rather than that one depended on the other.

Until recently cirrhosis of the liver was supposed to be entirely exceptional in children of any age under adolescence. Richard Bright, in his essay on abdominal tumors, published fifty years ago, describes a painless enlargement of the liver as very frequent; but his description evidently refers to the amyloid liver of syphilitic or suppurative cachexia. The writers of the two recent monographs which I have already mentioned, Howard and Laure, both introduce their subject by quotations from several authorities who testify to the rarity of hepatic cirrhosis in children. Thus Thierfelder, writing in Ziemssen's *Cyclopedia*, calls it absolutely rare. Henoeh says he has never found the disease fully developed in children. Charles West has seen but four cases among seventy thousand children. Gerhardt says that interstitial hepatitis is extremely rare, if the diffuse lesions due to syphilis be excluded. Rilliet and Barthez and also Despine speak in the same sense.

In my own small experience, which, however, includes a period of ten years at the Mount Sinai Dispensary, I have met with several cases of enlargement of the liver; but, with the exception of the present one, they were all associated with mitral insufficiency, evidently attributable to it, and diminished or disappeared when the force of the ventricular systole of the heart was restored. Eustace Smith, however, observes that "cirrhosis of the liver, although not one of the more common diseases in the child, cannot be said to be very rare." The author, writing in 1884, gives a description of the morbid anatomy of hypertrophic cirrhosis, which is entirely like that given in 1887 by Laure and Honorat, and especially in the

observation that new bile-ducts develop by proliferation in the newly-formed connective tissue which follows the ramifications of the original biliary canals. In atrophic cirrhosis, or hobnailed liver, the new connective tissue follows the branches of the portal vein, which are compressed; hence early obstruction to the portal circulation, which is not observed in the hypertrophic cirrhosis. The lesion is so denominated because of the hypertrophy of the liver, always perceived at first, and sometimes persistent to the end; and of the proliferation of connective tissue which takes place, as in the ordinary hobnailed liver. But the great distinction between the two forms of hepatic disease lies in the distribution of this connective tissue, which, as stated, follows the biliary canals, and not the blood-vessels. Moreover, the biliary canals proliferate, and this lesion contributes still further to the hypertrophy. Finally, for a long time, the liver-cells are not degenerated, but infiltrated with fat.

Laure and Honorat do not admit a distinct pathological demarcation between an atrophic and hypertrophic form of hepatic cirrhosis, but say that the liver is increased or diminished in size according to the period of the disease at which the patient has succumbed. The surface of the organ is never smooth, but always hobnailed. There is always abundance of fat in the hepatic cells, and such an abundant proliferation of biliary canaliculi as gives the appearance of a pseudo-adenoma. This fatty degeneration and biliary proliferation, added to the proliferation of interstitial connective tissue, with its peculiar distribution, constitute a mixed cirrhosis, which the authors regard as rather characteristic of the diseases in childhood. But Eustace Smith also admits by implication this progression of the one form into the other, for he observes, "It is probable that many cases of ascites whose origin is obscure may be attributed correctly to hepatic cirrhosis." But ascites does not occur while the hepatic lesion remains hypertrophic.

As has already been said, the Paris and Washington monographs, which both appeared in 1887, contain together a summary of seventy-eight cases. Of these, thirty-three are identical in the two essays, seventeen appear alone in the French, and

twenty-eight alone in Dr. Howard's paper; five cases are personal to Drs. Laure and Honorat; two cases, and most remarkable ones, are the personal observations of Dr. Howard.

In the first of these two cases, which occurred in a sister and brother, at an interval of six years, the liver was not more enlarged than in the child before you,—*i.e.*, did not reach more than two inches below the border of the ribs. In two of Laure's cases the liver was atrophied when the child was first seen, and the ascites present was attributed to a tubercular peritonitis. In the third the liver was four fingers' breadth below the ribs; in the fourth, two fingers' breadth; in the fifth the dimensions are not stated; only in the second of Howard's own cases was the liver, for a time, more greatly enlarged, so as to reach the horizontal level of the umbilicus. It subsequently diminished so as to be only two inches below the ribs. In our case, at one time, as stated, the left lobe of the liver reached the upper limit of the umbilicus, but the right lobe was never so much enlarged. It is much more common for the enlargement to predominate in the left lobe.

Of the seven personal cases with detailed history in the monographs cited, all died under the observation of the authors except one, who left the hospital before his fate was decided, and was lost sight of. Among the seventy-six other cases (Laure's personal observations are not included in his summary), a large number consist of records of autopsies only, without clinical history. Where this is given, death is said to have occurred in all but four, and in three of these it was imminent at the time of writing. In one case only—quoted by Howard from Reynolds in the *Medical Times and Gazette* of 1866—is the patient said to have recovered and left the hospital "strong and fat." This was a boy of three years old, who occasionally after dinner had been in the habit of receiving one or two ounces of beer. Symptoms began one month before admission to the hospital with feverishness and headache; in three days occurred jaundice and clay-colored stools, and a week later ascites, so that the girth of the abdomen was thirty and five-eighths inches. The area of hepatic dulness extended from the nipple to two and one-half inches below the margin of the ribs; the edges of the liver were hard, and its

surface hard and granular. The spleen was not enlarged. It is not stated how long the illness lasted, but the ascites and icterus ultimately disappeared, and the child left the hospital well.

This case, though differing in many respects from ours, resembles it in the important particular of recovery, if not from all lesion, at least from morbid clinical symptoms. It is most appropriate, therefore, to quote in this connection, when the question very naturally suggests itself, "Has this child Sadie really been the subject of an hepatic cirrhosis, or merely of a transitory hyperæmia of the liver?"

While the liver was enlarged, and the child suffering from symptoms of cachexia, icterus frequently recurring, low fever, hemorrhage from the gums and even from the stomach, the diagnosis of hypertrophic cirrhosis was made. The absence of ascites was explained on the theory of Eustace Smith, that, so long as the proliferation of connective tissue was associated with proliferation of the bile-ducts and absence of compression of the veins, there would be no obstruction to the portal circulation. When ascites occurred in June, 1885, it was presumed that the hepatic lesion was then entering upon its atrophic stage, and the prognosis, which had been uniformly bad, was not improved. Scarcely was a better outlook permitted when, eight months after subsidence of the effusion, the liver was found reduced in size; for this fact seemed to confirm the diagnosis as above stated. Now, however, that three years have elapsed since the condition of the liver and the spleen became stationary, and that there has been no recurrence of icterus, hemorrhage, fever, or ascites, we may, we think, conclude that there has been a positive arrest in the disease.

Is this, we must again ask, the exceptional arrest in a grave organic disease which, in the immense majority of cases, proves fatal? or is it the not exceptional cessation of recurrent attacks of hyperæmia of the liver, induced by recurrent attacks of malarial fever? Was the icterus due to no more serious functional disturbance than a transient gastro-duodenal catarrh with coincident occlusion of the ductus choledochus from swelling of its mucosa? and were the grave symptoms—the hemorrhage, cachexia, and ascites—to be laid to the account of the enormously-enlarged spleen?

It must be confessed that, in the fortunate absence of an autopsy, the categorical answer to these questions is extremely difficult.

It is known that malarial hyperæmia of the liver, as of the spleen, is not exclusively associated with distinct paroxysms of chills and fever, although these latter may be its most common origin. Hence the most marked cases usually occur with pernicious forms of fever. But splenic cachexia and tumor often result from chronic forms of malarial poisoning, and are initiated by the abnormal destruction of corpuscles in the splenic pulp, which is thereby much enlarged.

This child never suffered from distinct paroxysms of chills and fever such as cause the sudden and extensive enlargements of the liver by congestion. But she was liable for more than a year to irregular febrile attacks, lasting from two or three days to as many weeks, with moderate evening exacerbations, but often being nearly continuous, though slight. Only once was it observed as high as 103° , though, of course, it may often have reached that point when not observed by me, as I never visited the child at home. The form of the pyrexia greatly resembled that in Howard's cases. The interpretation had been that, although the lesions of the spleen and the liver had been initiated by a hyperæmia due to chronic malarial poisoning, the pyrexia was less an expression of that than of the morbid process in the liver, of a subacute inflammation of the connective tissue of that organ.

There have been two stages observed in the reduction of the liver: the first was observed in October, 1885, when the ascites had disappeared, and the left lobe of the liver no longer bulged into the epigastrium, but, though rendering the latter dull on percussion, was perceptibly smaller and flatter; in the second stage, observed in February, 1886, the right lobe had returned to the border of the ribs; the left did not reach the umbilicus, though still felt in the epigastrium. Since then there has been no further reduction in the size of the liver.

I have inferred that the first diminution in size depended upon lessened hyperæmia of the liver, but the second and more marked reduction was due to an atrophic process succeeding to the hypertrophy, but not proceeding far enough to compress the

portal blood-vessels. The spleen has been unable to diminish because to the hypertrophy of its pulp has succeeded an hypertrophy of its interstitial tissue, which has become thoroughly organized, and is submitted to no conditions of retraction. The splenic tumor has become an infirmity which occasions no inconvenience; the morbid process in the liver is arrested; the child is free from clinical symptoms, and considers herself well. Last October she had an attack of fever for two weeks, which was distinctly intermittent, and thus spontaneously distinguished by the mother from the nearly continuous febrile paroxysms of 1884 and 1885. This attack yielded promptly to quinine, and since then the child has been quite well. The gums, however, remain spongy and tender. The present girth of the abdomen is twenty-three inches.

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from April Number.)

V.—STOMATITIS GANGRENOSA.

STOMATITIS GANGRENOSA is a disease which may occur at any time of life, but is most commonly a children's affection, being found most frequently between the ages of three and seven years. In German it is called noma, which term is employed by the French, although they also use stomatite gangreneuse. English writers speak of the affection as cancrum oris, gangrene of the mouth, gangrenous stomatitis, and noma. Up to the present time we are not in possession of sufficient accurate knowledge to say definitely whether any gangrenous process which occurs upon the gums and cheeks is to be called cancrum oris or not. From clinical evidences it is most likely that a specific process goes on in those cases which are called noma, although it would be, manifestly, improper to

exclude any gangrenous process from this classification until the cause of the whole process is accurately determined. Some knowledge has been recently contributed to the etiology of this disease by Lingard (*Lancet*, 1888) and Ranke (*Jahrb. f. Kinderheilkunde*, III. xxvii., 1888), which permits us to hope that in the future this disease will be better understood than it is at the present day.

The affection is a comparatively rare one; in my own experience one case in about five thousand. Ranke (*loc. cit.*) states that in eleven years in Munich, seeing from four thousand to five thousand children yearly, he has seen only two cases (this in dispensary practice). The disease is a little more common in hospital experience, as bad cases are more frequently seen in hospital practice; in private practice the frequency depends very much upon external surroundings.

When we speak of stomatitis gangrenosa we mean a gangrenous process which begins upon the gums or inner side of the cheek, spreading with great rapidity so as to involve the whole substance of the cheek, and extending more or less to the surrounding tissues.

Etiology.—The first question to be answered is as to the infectious nature of the disease. There are a great many instances upon record in which the process has occurred in one ward of a hospital, in several members of a family, etc., so that evidence in this direction exists of the infectious nature of the affection. Again, on the other hand, every one who has seen any cases at all will have seen such in which it was impossible for the patient to have come into contact with any one who had had a gangrenous process of any kind. The experience of any one individual is too small to decide this question definitely, yet I venture to state that most physicians would answer it negatively. There are many things which speak in favor of the infectious nature of the disease; that it has occurred as stated above; that the process usually occurs, primarily, at the junction of the skin with mucous membranes, the anus, the genitals, the mouth, where infection takes place most readily (Gerhard); that the disease is found in affections in which the mucous membranes are in the best possible condition for the reception of infectious material. But proof, except by infer-

ence, is still wanting. There can be no doubt of the fact that cancrum oris occurs spontaneously without the existence of previous cases.

No disease exists in which the predisposing cause is accepted so universally as in stomatitis gangrenosa. This predisposition consists in a reduction of health in a way which, for the present, cannot be accurately defined. Ranke says concerning it, "We know that other carriers of infection require a certain amount of predisposition in order to develop their functions. In this direction the supposed virus of noma would have to be placed at the extreme end of the list of infectious agents. It would be necessary to premise that its attacks upon a healthy cell would be absolutely futile, and that it can manifest its effects only upon extremely-weakened cells." From a clinical stand-point we know that the weakening of the cells is produced by certain diseases: the acute exanthemata, especially measles (forty per cent. of all cases, Barthez and Rilliet), long-continued fevers and infectious diseases, typhus, whooping-cough, syphilis and scorbutus, chronic intestinal catarrhs and malaria. To this must be added the excessive use of mercurials, although this causative factor was very much overestimated in former days. Bohn has shown the importance of stomatitis ulcerosa as an etiological factor for noma, possibly as its forerunner, and therefore of great importance; but the connection between the two diseases in all probability ceases there. Malaria is looked upon by Hirsch as of prime importance, simply from geographical evidence; and while it cannot be denied that the reduction of general health may be produced by malaria, the direct cause must be found in something else. In general terms it may be stated that all those predisposing causes which have been enumerated under stomatitis ulcerosa are accepted for stomatitis gangrenosa. The fact, however, must be insisted upon that predisposition is so important that in any given case of noma the general condition of the patient would immediately be noticed by any physician, and would be a source of alarm upon very cursory inspection.

Investigations as to the direct cause are as yet in their infancy. Cornil and Babes make the statement that short

streptococci are found in stomatitis gangrenosa, and, in certain cases, rods like those of pulmonary gangrene. No allusion is made to cultures or inoculations by these authors. Ranke (*loc. cit.*) has found streptococci resembling those described by Koch as producing progressive tissue-necrosis in field-mice. He has made no cultures, but has inoculated rabbits with pieces of tissue taken from the immediate neighborhood of the gangrenous process. The animals died, but in no instance was he able to produce gangrene, so that in his conclusions, at the end of his paper, Ranke states that "up to the present the specific nature of the cocci present in cancrum oris has not been proven." Lingard (*loc. cit.*) found bacilli in thread-like growth 0.004 mm.—0.008 mm. long, 0.001 thick. Cultures were made as well as inoculations. Young pigs and calves were killed by these inoculations on the tenth and eleventh days, and septic lesions of the heart were produced. No statement is made concerning the production of gangrene except that the lower forms of life were also found in certain petechial spots in the human subject. It is difficult to judge of these results, as the heading of the article is "Cancrum Oris or Ulcerative Stomatitis," terms which, according to our view, are not synonymous. As, however, the term cancrum oris is so distinctive it has seemed to us that only the gangrenous process could be referred to.

It would be rash to try to bring these various observations into accord, the one with the other; as a *résumé* it might be well to state that all these observers have found lower forms of life in noma. Ranke has found them within the tissues; Lingard has cultivated them; both have killed animals, the one by inoculating them with the tissue, the other by injecting cultures. In no instance was there produced anything resembling the pathological changes of noma, although Ranke introduced a piece of diseased tissue under the mucous membrane of the mouth. It is impossible to state whether the poison has been isolated by Lingard or whether he has found the virus of something else. His description does not correspond with the one given by Frühwald (*Jahrb. f. Kinderheilkunde*, II. xxix., 1889) for a bacillus found in ulcerative stomatitis, and does not agree with the pictures seen by Ranke. Knowing, as we do,

the absolute importance of a predisposing cause, it is futile to discuss the method by which the direct cause acts before this cause has been isolated, so that the question cannot be definitely answered whether it comes from within the system as a poison of some sort, or from without as a lower form of life.

In the very great majority of cases some lesion is found upon the mucous membrane of the mouth which precedes the attack of gangrene. In some instances no lesion could be found, but on account of the locality of the process it has been found impossible to exclude such with absolute certainty. The case which has often been quoted from Gierke's article (*Jahrb. f. Kinderheilkunde*, N. F. 5, p. 269) as opposed to this view cannot be considered in this light, as the gangrenous process evidently arose from a stomatitis ulcerosa. The appearance of gangrenous spots upon the skin, in this case, could be readily explained if the assumption of a specific virus is accepted.

Pathological anatomy.—The process is one of rapid phlegmonous gangrene. Around that portion which has been destroyed there is found an infiltrated zone (Ranke, *loc. cit.*). This is characterized by true necrobiosis; all evidence of pre-existing tissue has disappeared under the microscope; in its stead there is found a perfectly homogeneous substance which shades off in the direction of the adjacent tissue. This homogeneous substance is already dead, and around it we find the connective tissue increased, its corpuscles in cell division and its blood-vessels closed by thrombi. The micrococci are found both in the homogeneous as well as in the proliferated tissues. Ranke has made interesting observations concerning the karyokinetic figures which, as he states, are found both in the fixed as well as in the wandering connective-tissue corpuscles and in the muscle-cells within the proliferated zone.

Symptomatology. I. *General.*—These symptoms vary very much, depending upon the disease upon which noma is ingrafted, for a healthy child cannot be attacked by noma. It may be stated that the intensity of the general symptoms is in direct ratio to the severity of the disease. A great many cases are upon record in which the children seemed in the beginning to be very little affected by the development of noma. Bohn gives a description of this condition which leads one to infer

that the children, in this disease, are rather cheerful than otherwise. While the fact exists that frequently patients will be attacked by stomatitis gangrenosa and pay very little attention to the local process, pulling out loose teeth, picking off pieces of gangrenous tissue, etc., in a very short time general symptoms supervene which show that we are dealing with a process which produces a very deep impression upon the general condition. Fever may not be present in the beginning, but develops sooner or later, reaching 104° to 106° , becoming hectic, especially when suppuration is present, and before death the temperature frequently falls to subnormal. The pulse usually follows the temperature, but throughout is weak, easily compressible, and small. Diarrhœa is present in almost every case. This diarrhœa is of the most intractable variety, and, as Gierke has pointed out, must be due to the swallowing of material from the diseased surface in the mouth. Lesions in the organs are also common, especially catarrhal pneumonia, probably due to the entrance of septic material into the bronchial tubes. Diphtheria has been observed in several cases (West, Gierke). As a result of the general infection, the local symptoms, the fever, the diarrhœa, death usually comes to the patient by exhaustion. The children then become apathetic, refuse all nourishment, are restless, and finally die in collapse. The nervous system is rarely implicated even in the worst cases.

II. *Local*.—The local process usually begins suddenly: if the result of a stomatitis ulcerosa, the symptoms of ulceration are changed to those of gangrene; if upon a comparatively healthy mucous membrane, the physician can never be in doubt as to the nature of the process. It is essentially a moist gangrenous process and characterized by all the symptoms of this condition. The beginning of the process is to be found, usually, upon the gums or upon the inner surface of the cheek, near the corner of the mouth, and, it is said, more frequently upon the left than upon the right side. Possibly the first thing that will strike the observer is the appearance of the peculiar odor of gangrene; if stomatitis ulcerosa has preceded the development of noma, the fetor of the former disease is covered over by the intense and penetrating odor of noma. Upon exami-

nation there will be found at the point of development an ulcer, gangrenous, which spreads with great rapidity. Very soon the cheek begins to swell so that if taken between the thumb and forefinger it will be felt to be thickened throughout its entire structure. This swelling is more or less oedematous, the skin becomes waxy, and in a very short time, sometimes within twenty-four hours, the whole side of the face up to the eyelids and down to the jaw or upon the neck becomes involved. This cheek may be painful upon pressure, but more commonly the patients do not complain of painful sensations. If we now look at the ulcer within the mouth we see that it has grown very much in depth, evidently eating its way through the substance of the cheek. As it comes near the integumentary surface, symptoms of its approach begin to manifest themselves upon the skin. The latter becomes discolored, red, blue, purple, black, or a combination of several shades. The reddish tint is usually observed in the beginning, and the spot of gangrene may be surrounded by a red areola. When the gangrenous process is completed there is always developed a dark spot. In a great many cases a bulla is formed, over the spot to become affected with gangrene, filled with ichorous fluid. The epithelial covering breaks and, with this, perforation of the cheek takes place. In case the bulla has not formed, melting away of the tissues takes place in one direction only, from within outward, the skin then may become mummified, but is finally softened and breaks down. Rarely is the gangrenous process completed when perforation has taken place; in one case which came under my observation, resulting from chronic malaria, there was what appeared as a cleanly-cut, oval hole. The rule is that the process now extends, involving the soft parts of the cheek, going down upon the neck, eating into the nose, the eyelids, affecting the frontal bone, destroying the eye, but rarely extending to the other side. In the mouth the devastation is apparently greater than upon the surface. While we find the destruction within the mouth to be very great in all cases, upon the surface it may be comparatively limited. Nothing is spared; the bones are denuded, the teeth loosened, the tongue and hard palate may become affected, even the soft palate and the tonsils may

become involved. The whole is converted into a black, fetid, pulposus mass. The patient may now be considered in a frightful condition, and there is hardly any sight so repulsive as a child with well-developed noma. If to this appearance there is added, as is not infrequently the case, the entire apathy of the child for the local condition, we have a combination which calls for the utmost sympathy on the part of the surroundings.

With all these changes the patient complains little of the local condition. The flow of saliva is very much increased; at first the patient swallows very well, but ceases to do this as the disease progresses. Again, the appetite may not be diminished; but this also disappears in a short time. The odor that fills the room is frightful; the whole house is sometimes filled with it, so that the diagnosis of gangrene can be made as one enters at the front door. Hemorrhages are quite rare on account of the fact that all the blood-vessels are closed by the thrombi.

The course of the disease tends either to death or, what is very much rarer, recovery, either spontaneously or as the result of treatment. When death comes it is as the result of the general condition. When spontaneous recovery takes place we find a line of demarcation around the gangrenous spot, the surface is finally converted into one covered by granulative tissue, and there takes place cicatrization, leaving frightful scars. This is also very rare. In most cases that have recovered it seems that the treatment has had something to do with the result. Relapses take place, but they are comparatively rare,—two cases out of twenty. (Gierke.)

The duration of noma varies from one to two weeks. Perforation of the cheek has taken place in as short a time as twenty-four hours, but usually takes three or four days.

Prognosis.—It is almost useless to discuss the factors which go to make up our prognosis in a case of noma, as nearly all cases die. The mortality is given as ranging from seventy per cent. to ninety per cent. of all cases affected. The statement can be made that the more intense the local process the greater the mortality. This seems paradoxical, yet the fact must not be lost sight of that when gangrene ceases, the patient still being alive and not affected by complications, the general condition upon which the final result depends must certainly become

improved. Complications, especially catarrhal pneumonia or diphtheria, will render our prognosis absolutely unfavorable.

Treatment. I. *Prophylactic.*—Unfortunately, little can be done in this direction. The disease may develop when and where it is least expected. Its development is very sudden, and, as has been stated, it may develop in patients whose mouths are apparently perfectly healthy. On account of the rarity of the affection the physician does not think of noma, and, fortunately, this is not necessary. In hospital practice the careful watching of individual cases, their possible isolation combined with antiseptics are certainly of value. The modern hospital, however, can hardly be charged with epidemics of noma, at least there are none such upon record.

The treatment of a case which has developed can resolve itself into two principal divisions,—1, the general; 2, the local treatment.

Of the general treatment little need be said. The disease is found in reduced subjects, usually in such which have been worked at by physicians precisely in that direction which seems needful for the cure of noma,—the improvement of general health. The indications in every case are to keep up the strength of the patient until it has become possible to make the attempt to cure the local process. The tonics and stimulants would come into play here, but always with the needed precaution not to disturb the digestion. The patient must be fed with condensed, nutritious food, if necessary predigested.

The local treatment has resolved itself to an artificial limitation of the gangrenous process by substituting an artificial destruction of tissue. For this purpose a great many substances have been employed. It is essential that the remedies be used as early as possible. Barthez and Rilliet, as well as others, state that the caustic ought to be used “before the deep tissues of the cheek are invaded.” The caustics which seem to enjoy the greatest reputation is hydrochloric acid, then nitric acid (West). Evanson and Maunsell report good results from the local application of sulphate of copper in six-per-cent. solution. The same authors also speak highly of sulphate of zinc in twelve-per-cent. solution. But it has always seemed to me that if anything is to be accomplished by treatment at all,

in this disease, we ought to have recourse to those remedies which act quickly, deeply, and thoroughly. For this purpose caustics must be used whose action is intense, destroying that with which they come into contact and producing distinct reaction. These caustics can be divided into chemical and thermal. Of the latter class we have the white-hot iron, the galvano-caustic wire, and the Pacquelin cautery. The chemical caustics that have been used are either in solid or fluid form, and nearly every chemical has been used that has caustic properties. Of the thermal caustics it has been said that their application is difficult and their action inexact because we could not tell where to find healthy tissue. The same objections (Bohn) have been raised against fluid chemicals, and Bohn therefore recommends nitrate of silver in stick. The great advantage of nitrate of silver, applied in this way, is that it does not attack healthy tissue more than seems necessary, but destroys all that is dead or becoming gangrenous (just as it acts in lupus vulgaris). The only objection to the use of nitrate of silver is whether its action upon the healthy tissue is sufficiently energetic to produce any benefit. If the indication is to cause deep destruction of healthy tissue, so as to produce demarcation well marked, the nitrate of silver cannot be relied upon. It is certainly a fact that some cases of noma will get well spontaneously : the only case I have ever seen recover did so with applications of a solution of permanganate of potassium without the use of any cautery, and therefore not all cases of recovery are to be attributed to the remedy used. In the two cases of recovery of Gierke, chloride of zinc and pyroligneous acid were used ; Foerster (*Jahrb. f. Kinderheilkunde*, v. p. 328) reports a case which was cauterized by using dilute muriatic acid, then nitrate of silver in stick, and finally in solution. The results of Evanson and Maunsell, referred to in high terms and corroborated by J. Lewis Smith, certainly show that some patients will get well without very much treatment, certainly without cauterization. As far as I am concerned, I would not like to take the risk of treating any case of noma without the use of a caustic of some sort. It seems to me that with the very bad prognosis, *quoad vitam*, the destruction of a little more or less tissue ought not to be

taken into consideration at all, especially when we bear in mind that much more tissue is already dead than appears when we judge by the classical gangrene color only. The object of a cauterization must be to destroy not only the waxy zone, but to go into the tissue, for some distance, that seems perfectly healthy, if we can dare to hope for setting up a process of repair, or closing up the lymphatics against further invasion.

If circumstances permit, the patient should be anaesthetized before the caustic is employed. This is frequently inexpedient on account of the great weakness of the patient. Before the caustic is applied all the necrotic tissue should be removed with forceps and scissors, and then the operator is ready. The galvano-caustic wire or Pacquelin's thermo-cautery seem to me to offer advantages that are not afforded by any other means. Their action can be limited, they can be made to act as deeply or as superficially as the operator may choose. It is necessary to take into consideration that when the cautery is applied when it should be, the inner surface of the cheek is the place where it will be used most frequently. It will immediately be seen how readily this can be done with either of these instruments when it would be very awkward with a fluid acid and very difficult with any of the fluid pastes. The question of how often the tissue should be cauterized has been answered: not more frequently than once in twenty-four hours. There certainly cannot be any law put down, as every case is a law unto itself. With cauterization the ordinary antiseptic methods of treating wounds will be sufficient local treatment for most cases of noma. Sometimes poultices will be required, sometimes the granulating surfaces will need to be treated. The surgical treatment of the cicatrices ought to be put off as long as possible, as it has been found that plastic operations do not succeed very well when performed early upon patients that have had noma, and also that noma may recur as the result of these operations.

It is unnecessary to add that the outlook, with all methods, with everything in apparently good condition, remains unfavorable to the patient, do what we will and do it as we will.

(To be continued.)

RECURRENT HEADACHE IN CHILDREN AND ITS TREATMENT.

BY RUSSELL STURGIS, M.D.,

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It is not uncommon to see children complaining of headache whose general health is apparently good. Such children are troubled with headache, more or less severe, recurring at intervals of days or weeks. You will generally find that the child has been subject to these headaches for a year or more before treatment is sought for this particular symptom; as a rule, it will be found that the patients are of nervous temperament; that they do not sleep well; that they grind their teeth at night, and frequently suffer from bad dreams and nocturnal terrors. Sometimes they may have spasmodic cough, particularly at night, even if there be no sign of pharyngeal or laryngeal irritation sufficient to account for such cough. It may be noticed that the child dislikes to keep quiet, and will change the position of its hands frequently, and shift its weight uneasily from one foot to the other while being examined. In temper the child is apt to be fretful. Nothing particular is to be noticed about the face except a peculiar heavy expression about the eyes. Warner* thinks this due to lack of tone in the orbicularis palpebrarum muscles, giving an appearance of flabbiness about the lower eyelid; the skin hanging too loose, with an increase in the number of folds, and in place of falling neatly against the lower lid as a convex surface, falling more or less in a plane from the ciliary margin to the lower margin of the orbit, a condition best seen in profile. This heavy expression of the eyes is not, however, noticed in all cases of recurrent headache. The headaches, as a rule, come on in the morning, though the child may have seemed

* "Physical Expression."

perfectly well on going to bed. The pain is generally localized in some particular part of the head, frontal region, either side, or at the vertex, being rarely in the occipital. The pain is usually severe enough to prevent work or play. We may meet with optical illusions of sparks or spots and bands of color. The child generally feels chilly and lies curled up in a chair near the fire. The picture is like that of migraine in adults, with this difference: the pain is more likely in recurrent headache to be across the forehead, at the vertex, or at the base; less often seen confined to either side of the head than in migraine. There is rarely nausea and vomiting. Dr. Eustace Smith, in his last book,* considers the headaches identical with migraine. Dr. Warner is inclined to think them but a mild manifestation of a choreic state. It has been shown, he says, by Dr. Hughlings Jackson and by Dr. Herman that in cases of chorea about seventy per cent. of children suffer from recurrent headaches. In my own cases I have seen little to support the theory that the etiology of chorea and of recurrent headaches is the same. I have noticed at most a general bilateral uneasiness, if I may so call it, the child appearing fidgety, but able to keep quiet by exercise of the will. In a few cases I have noted an involuntary twitching of the tongue when protruded, also bilateral. In no cases was there any inequality of cardiac action, nor were there noticed endocardial murmurs. None of the children had had symptoms of chorea, and none, so far as I have been able to ascertain, have had chorea since they came under my notice. At one time I treated a few mild cases of chorea as I would recurrent headaches, but was not satisfied with the progress made, and returned to other treatment; all of which, to my mind, shows the dissimilarity between such cases of headache as I describe and the recurrent headache noticed in chorea.

The question of heredity may be of importance. In several cases I have found that either the father or mother suffered, when young, from what they called "sick headache," some of them even now having the ordinary migraine of adults. I think, therefore, that in some cases recurrent headache in

* "Disease in Children," 1884.

childhood may be the precursor of migraine or of congestive headache in later years.

During the last six years I have seen some twenty cases of recurrent headache. At first I spent some time over these trying to relieve them by the general methods employed in headache. Not meeting with success, I at last remembered what Niemeyer calls the "fanciful hypothesis" of Drs. Bois Reymond and Möllendorf, that the pain may be due to excitement of the terminal sensory filaments of the fifth pair by dilatation of the capillary blood-vessels of the dura mater. I therefore tried ergot for its effect on the arterioles. The treatment has been on the whole satisfactory. My custom is, to satisfy myself that the headache is not due to gastric or intestinal disorder, to disease of the kidneys, heart, brain, or lungs; that it is not due to excessive use of tea or coffee, and that it cannot be accounted for by astigmatism or other abnormal vision. If none of the above causes for headache exist, I prescribe ten minims of the fluid extract of ergot, generally alone, sometimes with iron. I persevere in the use of ergot at least for two weeks after the disappearance of the headaches. In one or two cases I have kept it up longer. I give below four cases which are typical. Cases I. and III. were brother and sister: they were remarkable for having the heavy expression of the eye extremely well defined. Case II. was a very nervous child with the pain referred to the right side, which as a location is somewhat unusual. Case IV. had his attacks at night with pain at the vertex, and did not respond readily to treatment.

CASE I. (1882).—L. B., female; aged thirteen. She is tall, well nourished, but rather pale. She lives in a nice sunny house in a good neighborhood. Began to complain of headaches three years ago, but they did not recur with sufficient frequency to make it worth her mother's while to bring her for special treatment for them. Now she has headache as often as three times a week, lasting from when she gets up till when she goes to bed. During the attack she never has nausea, but frequently at that time sees "sparks of light and spots of red." The headaches are frontal. Slight astigmatism being detected, she was provided with suitable glasses, which she wore without

diminution in frequency of her attacks. Till January, 1883, I treated her in a general way with tonics, etc., without benefit to her. I then put her upon ergot, and in two weeks she was free of her headaches. They returned in October of the same year, but under ergot again they left her, and have not returned. In regard to this case it should be stated that she began to menstruate in the summer of 1883.

CASE II. (1884).—J. S., female; eight years of age; small, black-haired, nervous Irish girl; not anæmic; well along in her studies; fond of school and of playing out of doors. I had seen this same child before with headaches, due, as I supposed, to tea. Tea had been omitted for three months without relief, when she again came to me in March, 1884. She complains solely of headache, which comes on about once in two days or a week; eyes normal. She is unwilling to keep still much more than a half minute at a time while I talk to her, but can keep quiet when this is insisted on. In two weeks her headaches were relieved and have not returned.

CASE III. (1885).—Male; aged ten; brother of Case I.; complains of headaches of the same character that she had; the pain being frontal as with her. There is no astigmatism. He has nausea at the end of his attacks, which come about twice a month, and which last one or two days. Present attack disappeared under ergot and has not returned.

CASE IV. (1886).—J. M.; aged eleven; Irish boy; fond of play but not of school; general health all that can be desired. Free from headache during the day; at night is waked up by pain at the vertex. He thinks the attacks last about an hour and then pass off to recur again before morning. He has two bad nights a week. This case was examined with particular care, but nothing was found to account for the headaches. They gradually yielded to treatment after four weeks. In this case ergot was continued four weeks after the last headache, making nearly two months under half a drachm of ergot a day. No ill effects were noticed from the prolonged use of ergot.

SULPHIDE OF CALCIUM AS A REMEDY FOR
INFANTILE CONVULSIONS AND OTHER NER-
VOUS DISEASES.

BY H. VALENTINE KNAGGS, M.R.C.S., ENG.,

London.

THE literature of the past contains but few references to the action of sulphur or its salts on perverted conditions of the nervous system ; but that at times this mineral can exercise a powerful influence on these vital structures can hardly be questioned. It is my firm conviction that sulphur and sulphides are destined before long to take foremost rank as remedies for the relief and cure of spasmodic and convulsive nervous disease.

Here let me add, I do not for one moment imagine that this mineral can ever take the place of other drugs such as bromides, chloral hydrate, etc., which, in many of the slighter neurotic affections especially, have been so justly lauded. There are, however, a number of the severer forms of this class of disease which are generally accompanied by intense muscular spasms or convulsions, and are often further complicated with a marked elevation of temperature. For these disorders, when present in an intense form, the drugs mentioned exercise but a temporary effect. Here the sulphides in most instances not only adequately control the spasmodic and convulsive movements, but are curative in their action. They supply us with a new and hitherto unrecognized power of combating these diseases, nor is there any remedy which acts similarly to them.

In the writings of the ancient world we find here and there meagre references to the use of sulphur in diseases of the nervous system ; but among a very large number of recent medical works and periodicals, which I have consulted, there is absolutely no reference to the use of this mineral for such purposes.

Pliny, in his voluminous work on Natural History, mentions the use of sulphur vapor as a means of testing epilepsy. I quote the passage as it stands in Holland's translation of the above treatise: "As touching the nature of brimstone, so forcible is it that if it be cast into the fire the very smell thereof will drive those in the place into a fit of falling sickness if they be subject thereto."

In the nineteenth book of the same work we find garlic advocated as a remedy for the same disease: "There is a deep and settled opinion among men that if a man or woman do ordinarily take garlic with meat and drink, they shall find remedy thereby for the falling sickness." Richard Bradley,* a writer in the eighteenth century, confirms this statement when he states that if garlic be taken every morning it will relieve cases of this awful malady.

The virtues of garlic depend on the presence of a volatile oil, which is a combination of sulphur with a hydrocarbonized radicle,—allylic alcohol,—*i.e.*, the sulphide of allyl. *If this volatile sulphide will cure this affection, why not other sulphides?*

It certainly seems feasible to me that in the sulphides we shall eventually discover powerful adjuncts to the remedial treatment of such febrile diseases as tetanus and hydrophobia, which dangerously implicate the central nervous system, just as the specific properties of sulphur have already been amply demonstrated in whooping-cough.† Should subsequent experience show that they are not really curative, we shall at least have the consolation of knowing that their symptoms, which are so distressing to those who minister to the patient, are capable by its use of being suppressed.

The sulphide of allyl in garlic was used formerly by Valentine as a remedy for tetanus, who applied frictions of garlic juice over the spine in such cases. Dr. Keenan mentions‡ that brimstone held in the mouth is regarded as a specific for arresting the progress of tetanus, but, he adds, it will not cure when the disease is once fully established,—in other words, when used in this manner sulphur is a preventive of tetanus,

* "The Family Dictionary," 1725.

† See The Practitioner, 1888, p. 120.

‡ Lancet, vol. i., 1851.

but it cannot, apparently, remove the actual disease unless given in a more energetic and powerful form or, in other words, in larger doses.

According to the "*Dictionnaire des Sciences Médicales*," the exhibition of garlic in large doses has been successful in hydrophobia, though its efficacy requires confirmation.

Many of the older authorities on *materia medica*, etc., declare that sulphur as well as garlic, when applied to the wounds produced by the bite of a mad dog, will render that poison inert.

Mr. Chaussier,* in 1802, and many other observers subsequently, made experiments with sulphuretted hydrogen gas. They all agree that, when different animals are submitted to the action of an atmosphere containing this gas, death ensued after some few seconds, and that every means of resuscitation proved ineffectual. Frogs only were an exception, as they continued to live for some minutes.

Claude Bernhard† likewise made experiments on this gas. He stated that in the proportion of one to eight hundred it was sufficiently powerful to kill a large-sized dog, and of one in two hundred a horse. His observations tend to show that this gas could be taken internally with impunity, even in large quantities, since it was rapidly eliminated by the lungs before it could reach the arterial system. When inhaled, the gas is, of course, at once taken up by the arteries, and consequently proves toxic and dangerous to life.

Sulphuretted hydrogen, if respired, and to a less pronounced degree if taken internally, in sufficient quantity, is one of our most powerful nerve depressants. Its salts, when taken internally, act as acro-narcotic poisons, and on several occasions have proved fatal. As such they are stated to produce severe pain in the stomach, vomiting, great depression, and convulsions.

Nearly all forms of sulphur, including the salts of that mineral and vegetables that are rich in sulphides and sulphocyanides, when taken too freely by persons in health, cause headache and malaise.

* *Med. and Phys. Jour.*, 1802.

† *Medical Times*, 1857.

Several instances of chronic poisoning by sulphur have been recorded, in which a predominant symptom complained of was severe headache. Eichbaum has related the case of a man, aged thirty-seven years, who for eight years had used a sulphur ointment for scurfiness of the scalp, and during the greater part of this time he complained of headache, which only ceased on his discontinuing the ointment.

More recently a case was reported in the *British Medical Journal*, November, 1888, in which a man took one ounce of sublimed sulphur for piles, a second ounce being given shortly afterwards. The patient was in bed, utterly prostrate and partially insensible. He had repeated rigors during the day, and when conscious complained of intense frontal and vertical headache, with aching, griping pains in the bowels, etc. Under appropriate treatment, however, he completely recovered from this very large dose.

When garlic or onions are partaken of excessively their volatile sulphide equally produces headache, dyspeptic symptoms, thirst, and febrile heats. Moreover, the waters of Harrogate and other sulphurous springs may even, it is said, induce an attack of apoplexy, if the person drinking them is so predisposed.

In many diseases, especially if they are accompanied by the usual signs of fever, and particularly if headache and nervous phenomena are a marked feature of the attack, these remedies will frequently remove these very symptoms which in health they might have equally been capable of setting up.

It is every day becoming more adequately recognized that many remedies in large doses have an opposite therapeutic effect when given in small quantities. Thus phosphorus given as a poison is known to produce fatty degeneration of the internal organs, but when given in doses of from one-fiftieth to one-hundredth grain it actually improves the condition of the heart, etc., naturally undergoing the same degenerative process. "That a different action," says Dr. Phillips in his work on materia medica, "may be obtained from a different dose of the same medicine is an elementary therapeutical axiom in constant application, and it is, I believe, a chemical fact, that phosphorus can relieve the symptoms which are

usually associated with fatty degeneration of the brain as well as of the heart and other organs."

The same principle applies to arsenic, mercury, and many other drugs which in small quantities are capable of alleviating or curing those diseases which as a poison they will provoke.

Both arsenic and mercury are capable of producing severe gastro-intestinal disturbances, yet, when administered in minute doses, they will relieve the same if originated in other ways. Every one also is conversant with the fact that certain remedies which act as emetics will in small doses arrest that process. One minim of *vinum ipecacuanhæ*,* for example, is often an effectual remedy for sickness.

These statements are quite opposite to the case of sulphur. It has already been mentioned that this remedy, especially if given freely or continuously to a person in health, will be liable to cause headache, which may even deepen into other nervous symptoms, and possibly bring on convulsions, apoplexy, or an attack of epilepsy. Yet, when given to a patient suffering from such symptoms, especially if due to fever or neurotic taint, sulphur and its salts, when suitably administered, will frequently exercise a beneficial effect. Pliny's observation that sulphur vapor can determine an attack of epilepsy is quite consistent with facts; but, he might have added, by the internal use of the same mineral in the form of a sulphide this disease may, on the other hand, be prevented or arrested. We read further that Dioscorides in ancient days used sulphur vapor for the purpose of awakening the lethargic and drowsy. In modern times, also, it has been similarly used by Nysten,† who held a burning brimstone match under the nose, to rouse persons suffering from syncope or asphyxia.

In order to obtain safely a sedative effect on a perverted nervous system by the use of sulphur or its compounds we must give it in sufficient doses, for in very small or minute amounts it will be inoperative, and if given too freely it may aggravate the disorder. In chronic diseases it should be used for a long time, in order to keep the body under its influence

* See "Handbook of Therapeutics," by Dr. Ringer.

† See Vereira's "Materia Medica."

and so utilize effectually its alterative properties. For this purpose we can use sulphur and trust to its absorption as a sulphide, giving it in small, frequently-repeated doses. Secondly, we can use any one of the many sulphides, of which the calcium salt is the best known and most convenient preparation for medicinal use. Thirdly, we can avail ourselves of certain vegetables that are rich in sulphur constituents as an adjunct to the patient's diet.

The habitual use of vegetable foods rich in this mineral cannot be too strongly urged as a preventive of nervous disorders. Alliaceous plants, of which the onion is a type, or any of the well-known cruciferæ, particularly water-cress, are examples. Apart from their beneficial effects on convulsions, etc., they are very essential to the dietary of all persons.

The following case will illustrate the curative effect of sulphur in epileptiform convulsions:

Mr. B., aged sixty, a married man, has been a sufferer from epilepsy since youth. In his last attack, several years ago, he was admitted into a London hospital, where he remained for several months. The seizures were then very severe, of long duration, and the patient was quite a year before he completely recovered. There is no history of syphilis and no evidence of uræmia. His kidneys appear to be sound and the urine normal. He has been all his life a rigid teetotaler, but indulges perhaps too freely in tea. The present attack began at 5 A.M. on the 25th of June last, when I was summoned hastily to see him. The patient was in strong convulsions and quite unconscious. Nitrite of amyl was given to inhale at intervals, and a strong saline purge administered. The convulsions continued with slight intermissions throughout the day. In the evening one-half-drachm doses of potassium bromide were given every two hours. The following day he appeared better, and another saline purge was ordered. In the evening, after the bowels had acted freely, the attacks came on with redoubled violence, when he was given one-half drachm of potassium bromide with twenty grains of chloral hydrate every two hours until sleep was produced. After the second dose the movements were greatly diminished, and the patient got some sleep; but after the effects of the drug had worn off the

convulsions came on again with equal intensity. He was now put on ten-grain doses of antipyrin every two hours, and this was continued all the next day, the chloral mixture being still given at bedtime. On the 30th, five days after the commencement of the illness, the condition of the patient was practically as bad as when first seen. I now determined to give sulphur, of which he got four grains every two hours. From the very moment that he took this drug the convulsions ceased, and did not during the subsequent period of his illness return. It left the sufferer with a fixed delusion that he had an impossible duty to perform; but, by persevering in the remedy, this also eventually gave way. A week afterwards the patient expressed himself as feeling better than he had done for months. He was perfectly rational, and, although five months have now elapsed, by living on a non-nitrogenous diet, avoiding excitement, and taking a simple tonic for about a fortnight, he has continued well and in his usual health.

Perhaps the most brilliant results obtained by the use of sulphide of calcium are observed in the convulsions which occur in children from dentition, falls on the head, meningitis, and even in acute tuberculosis.

In these cases, which are often so intractable under ordinary methods of treatment, this drug may effect a cure, and that a rapid one, after other means have failed. It must not be forgotten, however, that sulphide of calcium is a much more powerful remedy than at first sight it appears to be. Consequently, the dose must be a small one. For infants under six months of age it is better to use Dr. Ringer's prescription, which is prepared by dissolving a grain of this sulphide in half a pint of water, and giving a teaspoonful of the solution hourly, when the dose can be cautiously increased, if thought desirable. In children over one year of age less caution will be required. The dose will vary from one-eighth to one-twentieth of a grain every hour, or less frequently according to the severity of the case. The drug must be freshly prepared and active, as it soon loses its virtues, and becomes inert. It may be mixed preferably into powders with sugar of milk, and a packet of them inclosed in tin-foil. They are best given in powdered white sugar. The faint sulphurous

smell, which is a sure sign of their activity, is not objected to by the little sufferers when thus given. It is, nevertheless, not infrequently a source of complaint from the mother or nurse, yet, when the latter witness the effect of the remedy, their scruples are easily silenced on this score.

Antipyrin may sometimes be alternated with the sulphide with advantage. These two medicaments appear to be antagonistic one to another. The one will be found to be capable of eliminating or neutralizing the other. In infantile convulsions antipyrin, in doses of one-half to two grains repeated frequently, will often aggravate convulsive movements in a child so predisposed. Should it appear that the sulphide is exerting too depressant an effect on the nervous system, antipyrin alternated with it will serve by its stimulant action to counteract this effect. If the breathing should become hurried or labored under the sulphide, though this is very rare when carefully given, a dose or two of antipyrin will diminish the number of the respirations, while the convulsions, if previously present, may reappear, though usually in a less intense form.

In thin, weakly children, without much stamina, it may be preferable to begin with minute doses of the calcium salt alternated with antipyrin, and many unpromising cases, I am convinced, can be cured by this form of medication. I may add incidentally, also, that nothing quiets the hurried respiration of children suffering from congestion of the lungs or bronchitis, especially when occurring as a complication of measles, more than antipyrin in appropriate doses.

The method which I would advise to be adopted in a case of threatened tubercular meningitis consists in cautiously administering the sulphide of calcium in suitable doses, and in holding over antipyrin should the sulphide prove to be too depressing. With care in merely giving just sufficient of this drug to act beneficially on the diseased brain, the antipyrin will be seldom called for. The patient might also be kept in a continuous atmosphere of eucalyptus steam from a drachm of the oil placed in a bronchitis kettle, or by the occasional use of a small hand-spray charged with the tincture.

I am convinced that I have recently been enabled to save the lives of several patients who, were it not for the sulphide,

would in all probability have died. The majority of the cases were treated solely by this salt without the aid of antipyrin or eucalyptus vapor, both of which may be regarded merely as useful adjuncts and mentioned as such. Herewith I append rough notes of a few cases of cerebral disease in infants treated in the manner set forth.

(1) I. S., aged two and a half years, is the only son of parents with a tubercular history. While standing on a chair to reach a flower-pot the child overreached himself and fell backward upon his head. There was at the time of the mishap no unconsciousness, but the little patient felt ill, vomited, and for about three days was restless at night, fretful, and suffered from anorexia. On the fourth day a severe convulsion set in which lasted for about an hour. Bromide of potassium, in doses of six grains every four hours, was given, but the child passed a very restless night and was much convulsed in his sleep. The bromide, however, was persevered with in gradually increasing doses until the twelfth day after the onset of the first convulsion. The condition of the patient was now as follows: He was extremely irritable, especially during the daytime, and this irritability came on in rhythmical paroxysms, being at first slight, then increasing in violence until it reached a climax, and afterwards subsiding. Two or three of these attacks would occur daily. At this stage the bromide had completely lost its influence. In spite of the use of aconite, iodide of iron, cold lotions to the head, iodoform ointment to the scalp, inunction of the body with salad oil, and other remedies, the boy was undoubtedly getting worse. At the end of the second week of the illness he entered into an almost continuous comatose state and the convulsions became incessant. There was slight Cheyne-Stokes respiration, and the case appeared to be so critical that as a last resort, on the nineteenth day of the illness, I determined to administer the sulphide of calcium, of which one-eighth of a grain was ordered hourly. From the moment that the child took this remedy the convulsions ceased entirely. The drug was continued for about a week in hourly doses until slight diarrhœa ensued, which I regard as an indication that this medicament has done its work. Afterwards three powders daily were given as a pre-

cautionary measure for about a fortnight. The patient made a rapid and uninterrupted recovery, and was able to proceed into the country in a month's time, whence he returned in his usual health. I cite this case at length as a striking example of what can be done with this drug. The action of the sulphide appeared to be so prompt and decisive that I have continued to use it extensively in similar cases, and hitherto with most gratifying results.

(2) C., aged sixteen months, has suffered from diarrhœa for about a month, and is greatly emaciated in consequence. During the time she has been teething, the gums being at the present time hard and swollen over the molar teeth. The child is fretful, and there are slight convulsions, which are worse at night. Five-minim doses of liquid hydrargyri perchloridum hourly, together with an exclusive diet of peptonized milk, were ordered. Under this treatment the diarrhœa gradually stopped, but three days afterwards the head symptoms became more pronounced. The gums were then freely lanced and four grains of bromide of potassium every four hours given. On the following day the condition of the patient was serious. She lies in an apathetic, lethargic state, continually wailing, her eyes half open, and slight convulsions occur continually. The child appears to be unconscious of its surroundings and refuses all food. One-eighth of a grain of sulphide of calcium was now ordered to be administered hourly. The next day the patient was much better, but had vomited one or two of the powders. The medicine was continued at less frequent intervals and the milk still directed to be peptonized. At the termination of another week the child was playing about in its usual health. The diarrhœa had quite ceased, and the child was rapidly putting on flesh.

(3) H. S., aged twelve months, a boy who from birth has been sickly and delicate. The present illness commenced by a fall on the head. Three weeks afterwards the child was restless, disinclined to sleep, feverish, teething, respirations 36. He was given a mixture composed of tincture of aconite (Fleming's) one-third minim with three grains of bromide of potassium every four hours. The next day the patient had become

much worse, and presented the following symptoms in the evening: Temperature 104° , thumbs turned in, pain on pressure over abdomen, comatose condition with fretful cry when roused, takes his food fairly well, bowels constipated. These symptoms being still more pronounced on the ensuing day, sulphide of calcium one-twentieth grain every hour was given. Under this remedy the child improved considerably, and remained better until the evening of the next day, when it relapsed, with temperature $103^{\circ}.8$, respirations 68, eyes glazed, and apparently moribund. The sulphide was now discontinued and antipyrin in one-grain doses was ordered. The last-mentioned drug at once diminished the number of respirations. The next morning the child was conscious, able to notice objects, and began to take food again. Towards evening, however, pronounced convulsions, with opisthotonos, began to appear. The antipyrin was now alternated with the sulphide of calcium, a dose of each being given alternately every two hours. By this plan the infant slowly mended, and in about three weeks' time was better than he had ever been in any previous period of his life, and continues well.

(4) H., aged twelve months, a sickly child, with a large peculiarly-shaped head, had a severe tumble about a month ago by falling down stairs, and has been ailing ever since. The present illness was ushered in with strong convulsions, which lasted for about two hours. He was ordered a mixture containing tincture of aconite (Fleming's) one-third minim with three grains of bromide of potassium every four hours, and to be anointed freely with salad oil. The day after the condition of the patient was as follows: The gums are not swollen, takes his food badly, and is comatose. Sulphide of calcium one-twentieth grain every two hours in milk was given. This treatment was kept up for four days, when the child seemed greatly improved. On the fifth day, however, it relapsed, suffering from a severe attack of measles with pneumonia, the former at the time raging in a severe form in the house. The respirations were now 64, all food was persistently vomited, and the comatose condition returned in a more intense form. The child lay in a listless condition during both day and night. It was put on peptonized milk, and antipyrin,

one grain every hour, was prescribed. The patient temporarily brightened up after the first few doses of this medicine, but died the next day evidently from pneumonia.

(5) W., aged two years, had a severe blow on the head from falling on a fender. The attack commenced by great restlessness, inability to sleep, distaste for food, troublesome cough, and constipation. Four grains of bromide of potassium every four hours were given to control the cerebral symptoms, and a linctus composed of five minims of vinum ipecacuanhæ with seven minims of succ. conii in syrup was used to relieve the cough; the child was also thoroughly anointed with oil. This treatment was persevered in for six days, during which time the patient remained in a stationary condition, becoming neither better nor worse. Sulphide of calcium in doses of one-twentieth grain every four hours was now administered. From that moment the child made a rapid recovery, and has since remained in the best of health.

There can, I take it, be no question that bromide of potassium, especially if combined with minute doses of tincture of aconite, is a most valuable remedy for the slighter forms of cerebral irritation, particularly if they originate from reflex causes, such as dentition or a disordered stomach. Inunction also, from its effect in restoring, or rather promoting, skin action, and so relieving internal organs, is equally invaluable in such cases. I generally give this mixture in conjunction with oil inunctions as a matter of routine. When this plan of treatment fails to effect improvement, I surmise that the case is one of a serious nature in which the brain-structures themselves are probably to a greater or less degree implicated. Here more energetic measures will certainly be called for, and it is at this stage that the sulphide becomes so useful. I think, moreover, that these few cases will sufficiently testify that in the sulphide of calcium we have a valuable addition to our list of remedial agents for the relief and cure of these frequently fatal diseases of children. Should the subsequent experience of others tend to confirm these statements, I cannot but help thinking that a new power will be at our command in combating the ravages of these tedious and harassing disorders.

LANOLIN IN CUTANEOUS DISEASES OF CHILDREN.

BY D. F. KINNIER, M.D.,

New York City,

Ex-Lecturer on Dermatology, College of Physicians and Surgeons, Boston; late Assistant to Dr. T. Calcott Fox, London, England.

WE are indebted to Dr. Oscar Liebreich, of Berlin, for the introduction of lanolin as a basis for ointments in the treatment of cutaneous affections.

This substance is obtained from the alkaline water washings of sheep's wool, being of a fatty consistency, and composed chiefly of cholesterine and fat-acids in varying proportions, and differs from ordinary fat by containing cholesterine crystals easily recognizable by the microscope.

Lanolin is at present being largely used as a basis for ointments, and very encouraging results are obtained from its use; but a further test is requisite before its proper sphere of usefulness is ascertained. But, I think, all except the most sceptic will admit its superiority over many ointment bases now in use. Owing to its ready absorption by the skin it is desirable to mix it with lard or some other similar body.

Experiments prove that when medicinal substances are combined with lanolin a more ready absorption takes place than when vaseline or lard are used as ointment bases. Lanolin, being of a tenacious consistency, should, as a rule, be mixed with some substance which will render it more pliant, thereby increasing its power of absorption into the cutaneous pores.

Experiments with various substances, as oils, vaseline, paraffin ointment, and glycerin, prove that the fatty bodies are preferably to be used as diluents for lanolin, because they do not interfere with the absorbing power of lanolin. Lanolin can be mixed with more water than other fatty substances, and when thus mixed a light yellow-colored salve results. Deiterich states that vaseline takes up four parts of water, lard

fifteen, benzoated lard ten, and lanolin one hundred and five parts. Many who have used lanolin speak very highly of it; others, on the contrary, find it no more efficacious than lard or vaseline. I have given lanolin a fair trial side by side with vaseline and other ointment bases, and I am in favor of lanolin.

Lanolin, being rapidly absorbed by the skin, should be mixed with one or two parts of some fatty substance, so that when applied to the skin for any length of time it will not leave it in a dry condition, which is the case when pure lanolin is used. Dr. Lassar, having used lanolin in a large number of cases, states that it causes no irritation of the skin, and speaks well of it in massage.

A few illustrative cases regarding the efficacy of lanolin may be useful.

Ichthyosis.—Henrietta F., five years old, and apparently healthy in all respects with the exception of the cutaneous disease at present affecting her. The patient's mother states that she noticed the eruption when the child was four months old, and it has continued ever since. The whole body is now covered with a characteristic eruption, most marked over the knees and elbows, where the scales are thickly collected, heaped up, and of a black appearance, due probably to neglect of bodily cleanliness. In this case the disease is more generalized than is commonly met with. The disease is well marked on the palms and soles, a rare site for this affection, especially in early infancy. The mother states that this condition of the child's skin was congenital, but many observations would seem to indicate that the disease is very rare at birth or during the first few months of infancy, bodily ablutions preventing the accumulation of scales. On account of the chronicity of the case a variety of treatment was adopted, the chief reliance being local therapeutics. The patient was frequently bathed in alkaline baths containing one to three ounces of carbonate of sodium.

These baths failing to produce the desired effect, the soap treatment was adopted, which consisted in rubbing the skin twice daily with soap, the patient in the mean time abstaining from baths. After the last soap application to the body, the patient was well bathed, and lanolin applied to those parts where the

disease was worse, especially the limbs. In this case I used ointments composed principally of lanolin, olive oil, petroleum, and glycerin, with varied results. The following ointment I found useful: R Adipis benzoate, ʒii; pulv. acidi boracici, grs. xxx; unguent. petrolei, ʒi. M. et ft. ung. Apply twice daily.

This ointment seemed to lose its efficacy after a while, and I substituted as a base lanolin, which had a more decided action on the scaly condition of the skin. The lanolin ointment was rubbed into the skin with greater ease than the above ointment, the skin becoming distinctly softer after its use.

Fanny F., six years old. Has a third attack of psoriasis, confined chiefly to limbs, with a few isolated spots over chest and back, psoriasis guttata. I had previously treated this patient for psoriasis, using vaseline as an ointment base, but for this attack I substituted lanolin for vaseline, and effected a more speedy cure. No other treatment was used beyond external therapeutics.

Mamie A., three years of age, with an angry-looking outbreak of eczema on the face, forehead, and arms, of one week's duration. The eruption appeared on the arms about a week after the appearance of the disease on the face. The mother states that the child was similarly affected when eighteen months old, but with a less severe attack than the present one.

Both arms being equally affected, I considered it a good opportunity to test the comparative value of lard and vaseline with lanolin. Accordingly, on the right arm I used the following ointment spread on lint: R Zinci oleat. pulv., grs. xxx; bismuthi oleat., grs. xl; vaseline, ʒi. M. et ft. ung. Sig. Apply.

On the left arm I used the same ointment, except that lanolin was substituted for the vaseline. The condition of each arm as regards the disease was alike as to severity of disease. I personally attended the application of the ointment in this case, and I found the arm on which the lanolin-zinc ointment was used was cured sooner than the arm on which I had applied the vaseline-zinc ointment, which fact I attribute to lanolin. In many cases of skin-diseases in which I have used lanolin I find it gives better results than lard or vaseline used

in same class of cases. I have used it in nearly all cases in which I have had occasion to prescribe an ointment, and have thus made a practical test of its value as a dermatological agent; and although it has in certain cases of acute inflammatory affections of the skin been disappointing, I think, on the whole, lanolin may prove to be of great value when a more extended trial has been given it. From my own limited experience I am satisfied with the results I have obtained from using lanolin. Lanolin is also very useful in chapped hands of children, accompanied by redness, eczema, and small abrasions, which are at times very annoying. Many methods have been resorted to to render the hands soft and smooth. A method which I have found very serviceable is as follows: After having washed the hands with soap and thoroughly dried them, apply a small amount of lanolin; rub this over the entire hand and remove any surplus with a dry towel. Dr. Meyer, of Berlin, uses

R Lanolin, 500 parts;
 Vanilla, 1 part;
 Oil of roses, 2 parts.—M.

Or,

R Lanolin, 1000 parts;
 Liquid paraffin, 200 parts;
 Vanilla, 1 part;
 Oil of roses, 2 parts.—M.

These ointments I have found very useful in chapped hands occurring in cold weather. Lanolin cream is also a pleasant application in cutaneous affections, the formula of which is the following:

R Lanolin, 5 parts;
 Sweet oil of almonds, 5 parts;
 Precipitated sulphur, 5 parts;
 Oxide of zinc, $2\frac{1}{2}$ parts;
 Extract of violets, 5 parts;
 Extract of alkana, $9\frac{1}{2}$ parts (this gives a rose color).*

In intertrigo occurring in the regions of the genitals and neck I have used the following with advantage:

* Archives de Pharmacie.

R Oleate of cocaine, 5 grs. ;
 Olive oil, ʒss ;
 Lanolin, ʒiiss.

M. et ft. ung. Sig. Apply.

Lanolin mixes readily with oil, lard, or vaseline, and medicinal powders rubbed up with it become quickly and finally subdivided.

Lanolin is absorbed by the skin more readily than lard or vaseline, as demonstrated by the following experiments: Upon inner aspect of right arm twenty-five grains of lanolin were rubbed for ten minutes. The left arm was treated with lard in like manner. At the expiration of ten minutes the greasy matter remaining on each arm was scraped off by means of a spatula, with the following result:

Weight of lanolin used.....	25 grains.
“ “ “ removed from skin.....	9 grains.
“ “ “ absorbed.....	15 grains.
“ “ lard used.....	25 grains.
“ “ “ removed from skin.....	15 grains.
“ “ “ absorbed.....	10 grains.

This comparative test showed that about two-thirds of the lanolin was absorbed when rubbed into the skin, while but a little over one-third of the lard was absorbed. A like experiment proved that lanolin was more largely absorbed than vaseline. Lassar finds that lanolin is very well tolerated, especially in cases where from the nature of the disease the skin is irritable. He recommends it highly as a base for ointments when deep penetration of the skin is desired, as in psoriasis, cases of tinea, chronic eczema, and in the inunction treatment of syphilis. To produce suppleness of the skin Lassar mixes lanolin with twenty per cent. of vaseline.

Lanolin is at times disagreeable, owing to the strong sheep's odor when applied to the body. This can be obviated by the addition of some of the essential oils to the ointment.

Another disadvantage is its consistency, which may be overcome by the addition of twenty or thirty per cent. of an ordinary fatty substance. Within the past few months Liebreich has called attention to an improved lanolin—lanolinum purissimum—in which the cholesterine ethers are entirely

absent, and the consistence such that dilution is unnecessary. This is much superior to the lanolin first introduced.

To resume: in acute inflammations where a protecting influence is desired, and not deep penetration, vaseline or lard are preferable to lanolin.

In cases of chronic eczema and psoriasis and diseases where there is thickening or infiltration, and where a degree of penetration is desired, lanolin will be found superior to other ointment base. Lanolin is more readily absorbed by the skin than other fats. Lanolin is preferable when deep penetration is desired. Owing to its consistency, lanolin should be mixed with lard or vaseline except when lanolinum purissimum is used.

THE CONTAGIOUSNESS OF DIPHTHERIA AND ITS MUNICIPAL CONTROL.

BY CHARLES WARRINGTON EARLE, M.D.,

Professor of Pediatrics, Woman's Medical College; Gynecologist Wesley Hospital, Chicago.

IN all probability what we now call diphtheria was known under other names as early as the days of Hippocrates. Its contagiousness was recognized by the Italian writers as early as 1632 to 1650, at which time it invaded Rome and other Italian cities. In our country, Samuel Danforth, living in Roxbury, Massachusetts, lost in 1659 the four younger of his twelve children by "the malady of bladders in the wind-pipe." Bretonneau, in 1821, read his first essay on this subject, and gave the disease the name it now bears. With us there has sometimes arisen the question whether a given case was diphtheria, follicular tonsillitis, tonsillitis without deposit, or simple ulcerative stomatitis. We have sometimes criticised physicians who have called a pharyngitis with a few white spots diphtheria. These cases have been denominated "homœopathic diphtheria." In view, however, of the fact that some of these very mild cases have proven markedly contagious, it is a question with me as to whether physicians who call them diphtheria and treat them as such are not in the

main correct. My conversion to this procedure was brought about as follows: In 1878 I was attending a family on North Ada Street, consisting of four girls and one boy. The female children had sore throats, characterized by redness, some pain, and a few white spots. It was diagnosticated as follicular tonsillitis, and the parents were informed that there was absolutely no danger. In the course of a few days the boy was taken with the same symptoms, which rapidly became more alarming. General infection took place in the course of two days, and death resulted. I have always thought that if I had diagnosticated diphtheria in the first patients, treated it as such, and sent the boy away from the infected locality, he might be alive to-day. This, with other cases, has changed my diagnosis and practice entirely.

About six years ago I was treating a case on Erie Street. It was a mild one and recovered rapidly. During the course of the treatment a relative of the family was journeying, with two children, from the East to their new home in Dakota, and stopped for twelve hours in this infected house. Neither the mother nor children were in the room with the mild case I was treating; indeed, not on the same floor of the house. They remained a single night in a remote part of the house, and in the morning resumed their journey. A week after arriving in Dakota one of the children sickened and died, in another week the remaining child died, and the mother barely escaped death from the same disease.

Although the contagiousness of this disease has been recognized for two hundred and fifty years, we at this day find members of the profession denying it, and refusing the greatest safeguard to not only their own families, but to the public at large, in casting their influence against isolation and other means to prevent the spread of the disease.

The authorities almost without exception are a unit in regard to its contagiousness. From a large number I select only a few.

Condie says it is capable of being propagated by a contagious miasm. Ellis pronounces it a contagious disease. Meigs and Pepper call it moderately contagious. Meadows speaks of its epidemic form. J. Lewis Smith considers the area of con-

tagiousness limited to the room, or to the immediate vicinity. He says the sputum and pseudo-membrane can communicate the disease. Jacobi thinks it *very* contagious; the patients and surroundings convey the disease; the poison rises to upper stories with the hot air. Eustace Smith insists upon its contagiousness. He says the risk of infection is in direct proportion to the amount of exudation, and the readiness with which the membranes can be detached and dispersed. Kissing is a mode of contagion, and should be interdicted. Fricout and Burley, in 1836, believed in its contagiousness. Kessler advocates the contagious view. Pepper thinks it is conveyed directly by patient, by furniture, dishes, etc., and through the air in short distances; it increases in direct proportion to the neglect of ventilation. Starr thinks it certainly contagious, though the power of contagion weak; is communicated from one patient to another, but not carried about in the clothing. Stenier pronounces it contagious, sporadic and epidemic; medium unknown. Duncan says one person in the house may communicate it to all susceptible persons, even if they are isolated. Day speaks of infection of the atmosphere in the room and house. Hillier thinks it contagious only when in epidemic form.

In this connection there are many questions which might with profit be discussed, such as the time of incubation, the identity or non-identity of croup and diphtheria. But its contagiousness, in my judgment, is of the greatest importance.

One would think from our discussions that the chief aim of the practitioner of to-day was to tube the larynx or perform tracheotomy. The object paramount in my judgment should be to prevent the disease, which in large measure can be accomplished if we are a unit as regards our opinions of contagiousness, isolation, and disinfection.

In view of the mortality from this dread scourge—a hundred-fold more than from smallpox—I see no reason why our local board should not have this matter in charge, investigating each home invaded by this disease, and seeing to it that what is known regarding disinfection and isolation is rigidly enforced.

After the discussion of the paper the following resolution was offered by Dr. Earle and adopted by the Society:

"Inasmuch as the contagiousness of diphtheria is recognized by the majority of medical practitioners; therefore

"*Resolved*, That the Commissioner of Health will be justified in placarding or otherwise designating houses infected with this disease."

INFANTILE HERNIA.

DR. OLIVER P. KERNODLE, of La Monte, Missouri, reports the case of an infant five months old, feverish, with a spasmodic cough simulating pertussis, with which it had been suffering during the past two months, without relief from the ordinary cough mixtures. Upon examination he could find no lesion in the air-passages to account for the cough, but there was a painful swelling of the right side of the scrotum, which had existed for four or five days. The hernia was reduced without difficulty and was retained by the application of a knit sock. The cough ceased at once, the child became quiet, and the slight rise of temperature subsided in a few hours. Upon further inquiry he learned that all the other children—four—had been affected with a hernia in infancy, and of these, two were scrotal, one umbilical, and one inguinal. The mother is well developed and enjoys good health; the father also enjoys good health, but is somewhat crippled in the left thigh and hand from wounds received in the late war. Neither of them ever had a hernia.

CORRIGENDUM.—On page 272, for Dr. Walter Roe read Dr. Walter Rae.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Carpenter, George A.: Observations on the Use of Glycerin Enemata in Children. (*Lancet*, November 10, 1888.)

During a period of four months glycerin enemata were used at the Evelina Hospital for the treatment of constipation, to the exclusion of purgatives. The children were not allowed to pass more than two days without an action of the bowels. A carefully-prepared table is submitted, showing the result of two hundred and fourteen injections in sixty-three children. One drachm of glycerin was given in one hundred and fifty-six cases, one drachm and a half in forty-eight, and two drachms or more in but nine.

In one hundred and fifty-four instances the injection was followed by normal motions, in twenty-six they were loose, and in twenty-four of more than normal consistency or composed of scybala. In ten only did the enema fail to act. In no instance were there unpleasant symptoms, either local or constitutional. No child was found whose bowels failed to respond to the glycerin stimulation at one time or another.

As regards the time of action, ninety-five injections were followed by motions within five minutes, ninety within thirty minutes, while with the remainder the time varied from thirty-five minutes to eleven hours. The failures or cases of delayed action were in tubercular patients or those who had undergone operation and were therefore restrained from exercise or movement.

After a brief summary of the action of various cathartics in common use among children, the author expresses himself as very favorably impressed with glycerin enemata, which are easy of application, unattended by pain, quick and natural in action, and followed by but few failures.

Ollivier: Contagiousness and Antiseptic Treatment of Vulvo-Vaginitis in Little Girls. (*Le Concours Méd.*, November 3, 1888.)

For a long time this disease was considered as an evidence of the lymphatic temperament. Among poor people it has frequently been confounded with blennorrhagia resulting from rape or attempted rape. Since microbial pathogenesis has been developed it has been customary to consider it as a para-

sitic disease, especially since it often occurs as an epidemic in hospitals and other public institutions in which large numbers of children are brought together. Such an epidemic recently occurred at the baths of Lavey, in Switzerland, where the disease was propagated by means of the water in a tank in which the little girls were bathed. The author has recently studied the disease with great care, and has arrived at conclusions which make the pathogenesis of the disease very clear. In July (1888) he found two little girls in his hospital service who had the disease. Three weeks later fifteen other children in the same hospital were similarly affected. Upon inquiry it was found that the attendants who bathed the children who were first attacked did not wash their hands before bathing the others, and used the same sponges for all. One dirty chamber-vessel did service for all the children, and hence it was easy to understand how the disease might be communicated. These evils being remedied, and cleanliness and antiseptics being insisted upon, the disease disappeared and has not reappeared. The author does not know whether the microbe of vulvo-vaginitis is a particular bacterium or only one of the common microbes of suppuration. It is evidently a microbe of low vitality, for it is readily destroyed by so weak an antiseptic as boracic acid. The vulva and vaginal entrance should be irrigated with a hot solution of it several times daily. Absorbent cotton dusted with boracic acid should then be placed upon the vulva and between the labia. A. F. C.

Mercier: Croup cured in Forty-eight Hours with Chloral. (*Journ. de Méd.*, October 14, 1888.)

The results which the author reports from his method of treatment are certainly gratifying, whether they do or do not inspire the same degree of faith which he manifests. Before using the chloral a simple emetic of ipecac is frequently indicated. After the disposition to vomit has passed away one should commence giving the syrup of chloral, from two to five grammes being given every half-hour, according to the age of the patient. Before each dose of chloral a drink of water should be given, that the tissues of the throat may be impregnated with the chloral as long as possible. Additional treatment may consist of inunctions of ointment of belladonna and mercury, to overcome the glandular swelling. The ointment should be applied to the anterior and submaxillary regions of the neck, the latter being then wrapped in cotton. At the end of twenty-four hours there is no change in the condition of the disease, but at the end of forty-eight hours the false membrane will have completely disappeared. The

strength of the patient should be sustained by suitable means. In cases of laryngeal diphtheria the chloral treatment is contra-indicated; it is harmful rather than helpful. In one hundred cases of croup the author had only five failures from the chloral treatment, and then only because it was begun too late.

A. F. C.

The Mortality of Measles in the Large English Towns. (*Lancet*, December 8, 1888.)

While during recent years there has been a marked decline in the mortality from scarlet fever and typhus, there has been considerable increase in that of measles and diphtheria. From 1871 to 1880 the annual death-rate from measles averaged three hundred and seventy-nine per million. Since 1880 the mean annual rate has risen to four hundred and forty, the rate for 1887 being five hundred and ninety-four,—higher than in any year since 1859. The curve of mortality usually reaches its maximum in December and its minimum in June. The numbers fluctuate during the summer, averaging fifty-five per week in October, from which time they rapidly increase until December.

Class-mortality statistics prove that fatal measles is almost exclusively a disease of the poorer classes, confirming the correctness of its classification among the more strictly preventable diseases. Those towns in which sanitary neglect has been most marked have suffered from the largest mortality rate.

Le Gendre: Local Antisepsis and Diphtheria. (*Le Concours Méd.*, August 11, 1888.)

With all the methods and agents which have been recommended for the treatment of diphtheria, and in consideration of the fact that the bacillus of the disease has not been positively defined, the author thinks that nothing better, in the way of treatment, can be suggested than that the rules of local antisepsis be minutely carried out. Those substances should be used which are as powerful as any, but they must not be too toxic, nor must they irritate locally in such a way as to interfere with alimentation. It is believed by the author that diphtheria is always a local disease at first; but the first stage often passes unperceived. According as the infectious agents develop upon the surface of the mucous membrane upon which they are implanted the latter reacts by the production of a fibrinous exudate and by epithelial desquamation. The soluble poisons resulting from the microbes and absorbed by the organism then produce general intoxication, which occurs with greater or less rapidity in accordance with certain conditions not yet clearly

understood. Local antiseptic treatment should be begun as early and continued as thoroughly as possible. Proper hygiene and alimentation should be insisted upon, with tonics and stimulation of the emunctories, plenty of air, milk in abundance, eggs, meat, if there is no albuminuria, Bordeaux and sherry wine and champagne, also coffee. The local treatment which is advised is the following: three or four times daily the false membranes and the surrounding tissues should be touched with a one-per-cent. alcoholic solution of sublimate. Every two hours there should be free irrigation of the diseased surface with a hot saturated solution of boric acid, followed by atomization; the latter may even be done more frequently than once in two hours. In place of the strong solution of sublimate a solution of the biniodide of mercury dissolved in water with the iodide of potash may be used, the latter causing less pain than the former. A mixture consisting of naphthol, five grammes; alcohol, five grammes; glycerin, one hundred grammes; has also been used by the author with success. It is applied to the diseased surface by means of cotton attached to a probang. It causes at first a sensation of warmth, but this is followed in a few minutes by one of intense cold, with anæsthesia of the mucous membrane. It is followed by no inflammatory reaction, nor by toxic effect; and may be used to the extent of two or three grammes daily without harm. Irrigations may also be made of a solution of twenty centigrammes of naphthol in one thousand of water. Without making any definite statement as to the value of this treatment, the author has thus far found it as satisfactory as the mercurial treatment.

Another method of antiseptic local treatment is that of Gaucher. He uses a mixture of camphor, carbolic acid, and tartaric acid, according to the following formula:

R	Acidi carbol. crystal.,	5.	grammes;
	Camphoræ,	20.	grammes;
	Acidi tartar.,	.70	gramme;
	Alcohol @ 36°,	10.	grammes;
	Ol. Olivæ,	10.	grammes.

This is to be applied to the diseased surface with a brush or a cotton-tipped probang. This application is usually followed by severe pain, which is the chief objection to it. A number of well-authenticated cases have been reported in which it has produced a cure.

A. F. C.

Holt, L. Emmett: The Prevention of Summer Diarrhoea among Infants, viewed in the Light of the Lesions. (*Medical News*, February 23, 1889.)

The author expresses the opinion that the dyspeptic intes-

tinal catarrhs of infancy produce lesions of considerable importance, not so much in their immediate effects as in their relation to the severer forms of the disease, particularly enterocolitis.

His attention was first drawn to this subject by two autopsies upon children ten months old. One died of acute pneumonia without intestinal complications. Throughout the large intestine the solitary follicles were increased in size and number, some being eroded at their summits, as if about to ulcerate. The child had been nursed entirely, and its health seemed good, but during its first five months of life the bowels were never normal, the passages being green and nearly always containing mucus; in number they were never more than three or four daily. This gradually improved without treatment, and during its last five months the bowels were in every way normal.

The second child fell from a window and died within an hour. In this child the colon was found in a condition similar to the other case. The patient had never had acute diarrhoea, but for three weeks before death the stools had been green and containing mucus.

The microscope showed but slight catarrhal changes, the important feature being the great enlargement of the solitary follicles. Examinations of other cases, in which a dyspeptic intestinal catarrh had been allowed to run on without treatment, showed similar changes in the intestinal wall. If a child's intestine is examined some months after an attack of enterocolitis, similar anatomical changes will be found.

In cases of acute enterocolitis of ten or twelve days' duration the solitary follicles are enlarged, and where they have broken down small circular ulcers will be found. Since the condition in dyspeptic catarrh is similar, it may be regarded as identical with the first stage of the ulcerative process. The swelling in both cases is probably due to the same cause: the absorption of ptomaines produced by the intestinal decomposition.

The majority of all severe and fatal forms of enterocolitis in summer are preceded, often for weeks, by a dyspeptic catarrh; this often passes unobserved, the mothers attach so little importance to it, especially if the infants are teething.

The author reports fifty-seven autopsies upon cases of diarrhoeal diseases. In almost every case the solitary follicles were enlarged; in nineteen follicular ulceration existed.

Follicular changes are slow in disappearing: this explains the long continuance of what are apparently very mild cases of intestinal catarrh, and the frequent relapses after more acute attacks.

The treatment of follicular ulceration of the intestine is very unsatisfactory: the proper treatment is preventive: every diarrhœa should receive early and intelligent treatment; best obtained by proper digestion, which means proper feeding; and especially be careful not to overfeed.

Meigs, A. V.: Treatment of Spasmodic Croup with Opium. (*Medical News*, March 23, 1889.)

In the term spasmodic croup the author includes all forms of the disease characterized by the absence of false membrane. Though rarely fatal, it causes so much suffering which might be prevented or relieved that its successful treatment should be carefully studied.

The first treatment in all severe cases should be an emetic, and the best for prompt effect is a teaspoonful of powdered alum mixed with a teaspoonful of syrup of ipecac; if emesis does not occur in ten or fifteen minutes, repeat the dose. The use of an emetic must be decided by the symptoms: if there is no dyspnœa, it will be unnecessary, but if there is marked obstruction of respiration and retraction of the base of the chest and suprasternal fossa, emesis should at once be induced. The alum and ipecac mixture acts with great promptness, has most marked effect in relaxing laryngeal spasm, and produces very little physical exhaustion and relaxation afterwards. The author regards it as better than ipecac alone, sulphate of zinc, or antimony; this last, he says, is not safe.

If it be decided that an emetic is unnecessary, the author administers a dose of laudanum and ipecac; and orders a second dose in an hour if the first does not produce a marked calming effect,—the object to be attained being to give such an amount of laudanum as will produce a moderate but decided soporific effect without narcosis, and of ipecac, to relax spasm, but not nauseate. This end would be obtained in adults by giving twenty drops of laudanum and fifteen of syrup of ipecac, and, if necessary, a second dose in an hour of ten to fifteen drops of laudanum and ten to fifteen drops of ipecac. In children the dose must be graded to the age: for a child two years old start with two drops of laudanum and ten drops of syrup of ipecac, this to be repeated after an hour or later, if necessary; for an infant two to six months old, half a drop of laudanum and five to six of syrup of ipecac is the safest to begin with, and repeat in an hour, if the first be insufficient.

If the case is severe and an emetic has been given, wait half an hour after it has acted, and then give one or two doses

of laudanum without the ipecac, to induce sleep and relax spasm. It will often prevent a recurrence of the spasm. The child will appear bright the next day, but the disease is not cured, and will return the second and even the third night unless preventive treatment is instituted. This consists in keeping the child in bed the next day, and giving every two hours minute doses of paregoric and ipecac, and if there be fever, nitre. Children two to five years old should receive five to ten drops of paregoric and five drops of syrup of ipecac. When the second night comes laudanum and ipecac should be given at bedtime, the dose corresponding to that of the night before, and repeated, if necessary. During the second day the child should remain in bed and receive the paregoric and ipecac, and at bedtime the laudanum and ipecac.

After the third night, unless the case is unusually severe, the cough will become loose and there will no longer be any danger of a return of the spasm; so that the treatment after the spasmodic symptoms have passed is that of a coryza or bronchitis.

The author quotes extensively in support of his treatment of croup with opium.

In concluding his paper he expresses the opinion that an unusual susceptibility to the influence of the drug in children is not common, no more so than in adults, among whom when it occurs it is called an idiosyncrasy. The reason for its bad name among physicians is that the initial dose has been too large; but, if properly handled, many advantages will be derived from its use.

Dalland: Hand-Feeding as a Cause of Rickets. (*British Medical Journal*, December 1, 1888.)

Among sixty-five cases of rickets at the York County Hospital, sixteen were nursed entirely for three months, twelve for six months, five for nine months, five for twelve months, twelve for more than twelve months, and fifteen only were brought up by hand entirely.

Irving, John: Decaying Vegetable Matter as a Cause of Diphtheria. (*British Medical Journal*, December 8, 1888.)

The author, in support of his belief that decaying vegetable matter may generate diphtheria, describes an epidemic occurring in a town of Cape Colony. There had been no case of the disease in the town for three years. The supply of water was drawn from a single source,—a stream flowing unprotected through the streets. He admits, however, that there had been heavy rains for two weeks previous to the outbreak, washing

out every exposed privy and kraal, and carrying filth accumulated (in some instances for years) straight into the stream.

Insurance and Infantile Mortality. (*Lancet*, January 12, 1889.)

The causes of infantile mortality are numerous and complex; but lately considerable prominence has been given to what has been asserted to be one of them,—*i.e.*, the insurance of infant lives in industrial companies. Some striking facts have been brought out which deserve serious notice. Exact statistics cannot be given until careful comparison can be made of the death-rate of infants among the working-class whose lives are insured with those of the same class who are not. There is certainly much to be said in favor of prohibiting insurance on the lives of children under two years of age, and of limiting the amount of insurance to a sum sufficient to insure decent interment.

Bridgman, Henry C.: Measles and the Closure of Schools. (*Lancet*, January 19, 1889.)

Experience has taught that the sooner a school in which measles has become rife is closed the sooner the disease is stamped out, and the less the school attendance, in the long run, suffers. In schools of one thousand scholars the average attendance was reduced to seventy-five per cent. They were closed for a month, and opened with an attendance of eighty-eight per cent. in the upper and sixty-eight per cent. in the primary departments. In other schools of seven hundred scholars the attendance was reduced to seventy-five per cent.; after closure for a month the attendance was eighty-six per cent. To be effective, closure for measles must last three weeks at least, and usually a month. No child should be allowed to return from an infected house until a full fortnight has elapsed from the commencement of the last case.

II.—MEDICINE.

Ollivier: Origin and Nature of Whooping-Cough. (*Rev. Mens. des Mal. de l'Enf.*, May, 1888.)

The author is in accord with most of his contemporaries in the belief that whooping-cough is an infectious and transmissible disease, and it is possible to say that this has been almost if not quite demonstrated experimentally. This position has been reached by a process of evolution through the various stages of belief that the disease was a catarrh, a tracheo-

bronchitis with convulsive cough, an infantile asthma, a non-contagious disease, a simple neurosis, a contagious disease by imitation, etc. Contagion is the sole cause of the disease. It seems probable that there is a primary infection of the respiratory mucous membrane which is susceptible of propagation. There are also arguments in favor of the theory that it is a manifestation of a general infection, such as the fact that one attack of the disease gives immunity for the future; that only children, as a rule, are subjects of it; that it is without fever, in uncomplicated cases; and that it usually makes very small inroads upon the general health of the patient, however violent may be the paroxysms. Precise researches concerning this disease were not made previous to 1870, but at that time Letzerich found in the sputa of whooping-cough patients round and oval spores, which, at a later stage in their development, gave place to certain fungi. These fungi introduced into the tracheæ of tracheotomized rabbits were followed in eight days by laryngo-bronchitis with attacks of convulsive cough and increased secretion from the nasal fossæ. In the latter were found spores analogous to those which had been introduced into the larynx. The animals being killed, tracheo-bronchial catarrh was evident and pulmonary congestion with foci of broncho-pneumonia, but no spores. In 1874, Letzerich cultivated his spores and obtained groups of micrococci in irregular chains. Tschämmer repeated these experiments in 1876, and produced whooping-cough in his own person, characterized by attacks of convulsive cough and lasting only two days, after an incubation period lasting a week. Two years subsequently, Birsch-Hirschfeld went carefully over the same ground, and failed to confirm the conclusions of Letzerich and Tschämmer. The development of bacteriology then brought into the field Naguère, Henke, and Rossbach; but their work was uneventful. The same was true of the work of Burger in 1883, who described a new bacillus, which he declared was not found in any other affection of the respiratory system. In 1886 the question was studied anew by Afanassien, and with great thoroughness, past investigations and conclusions being entirely ignored. The investigations were made upon his own children, four of whom had the whooping-cough, and it was impossible to determine the source whence the first one obtained the disease. The bacilli which he obtained, and which he considered characteristic of whooping-cough, were circular or oval, of a pale-cinnamon color, and from 0.2 to 2.2 millimetres in length. They appear in four to fifteen days after the first manifestation of the disease, and may sometimes be found for a period of four months. Inoculations of the cultures were

made with the greatest care, six rabbits being used and twelve puppies. Some of the animals died two or three days after the operation; others survived a few days longer; others recovered after experiencing a disease which closely resembled human whooping-cough. In those which died after experiencing this disease subacute bronchitis was found, with disseminated foci of broncho-pneumonia. The mucus from the larynx and trachea contained great numbers of bacilli. Semtchenko, working also upon this problem and obtaining the same results as Afanassieu, concludes that the bacilli are specific, that they may appear as early as the fourth day of the disease, that they multiply in the organism until the disease reaches its height, that they disappear while the paroxysmal cough still persists, and become more numerous when broncho-pneumonia develops. It remains to be seen whether subsequent investigations, both clinical and pathological, will establish the foregoing propositions upon a firm basis.

A. F. C.

Lenhartz: *The Secondary Affections in Scarlatina.* (*Jahrb. f. K.*, Bd. xxviii. H. 3 and 4.)

The following paragraphs express the results of the author's investigations. From sections of the pathological specimens which were obtained from diseased organs a micrococcus was obtained from which pure cultures were developed. The micrococcus was identical with that which has been described by Löffler and others, and it greatly resembled the erysipelas coccus of Fehleisen. Inoculation of the pure cultures in mice produced an erysipelatos disease, which was sooner or later fatal. Experiments with rabbits were negative, either on account of the small number of trials made or because of immunity to this disease. An erysipelatos disease was produced by a small portion of coughed-up secretion from a child with scarlatinal diphtheria which touched a slightly-eroded portion of the skin of a person who was in other respects healthy. It is evident, therefore, that this micrococcus is one of the fungi which exist almost everywhere and which have a particular predilection for an albuminous soil. When the pure cultures were applied to an erosion of the nose of a healthy man only an erysipelatos disease resulted; even when the tonsils were experimented upon no extensive disease was excited, unless the tissues had been previously diseased. But in a case in which the tonsils were destroyed the neighboring glands became gangrenous. It therefore appears that there is a direct migration of the cocci into the blood through the walls of the veins, or the infection of the blood is accomplished by other means which have not as yet been demonstrated. This

invasion by fungi may not be able to destroy at once the system which has been weakened by the scarlatinal poison, but in a short time death may come, preceded by high fever and suppuration of the joints. It is important to improve the resisting power of the tissues in scarlatinal affections as much as possible. Mixed infection—that is, with more than one variety of coccus—is possible, and two cases are reported in which there was ingrafted upon typhoid fever a fatal infection by means of an hypodermic syringe with which some tincture of musk was injected into the tissues of the thigh. It is also worthy of note that the bacteria by which the secondary infection is produced may be harmless when introduced under normal conditions of the system.

A. F. C.

Shaw-Mackenzie: Tape-Worm in an Infant on Raw-Meat Diet. (*Brit. Med. Jour.*, January 5, 1889.)

At twelve months of age raw meat was begun, being given on alternate days finely scraped. After some months of improvement the general health declined, and when nineteen months old joints of the tape-worm were noticed in the passages. Male fern was administered, and several feet of worm were passed.

Hood: Clinical Notes on Diphtheria. (*Lancet*, January 12 and 19, 1889.)

Its relation to tonsillitis.—That a simple tonsillitis may sometimes be the exponent of the specific contagium of diphtheria the writer does not doubt. He is, however, far from admitting as diphtheria all cases commencing as follicular tonsillitis with independent centres of inflammation, with subsequent coalescence into a continuous membrane. A tonsil covered with exudation may mean only a local catarrhal inflammation; while, on the other hand, a simply reddened tonsil may point definitely to diphtheria. One diagnostic point is that in catarrhal exudation the exudation does not extend beyond the tonsil, while in the specific disease other parts are usually involved.

Paralysis consecutive to sore throat is regarded as definitely settling the question as to its specific nature.

Glandular enlargements.—We are so much occupied with ideas of false membrane that sometimes the disease is overlooked when its early prominent symptom is glandular enlargements.

Two such cases are reported which so resembled mumps in the swelling that but for other cases of diphtheria occurring at the same time they would have been overlooked in the first days.

Relation to impure air.—Many different varieties of sore throat may be referred to impure air and bad drainage. The writer believes that a patient suffering from simple catarrh or inflammatory sore throat is liable from exposure to foul air to change in character of the throat attack, the disease then assuming a membranous or infectious character.

Treatment.—All irritating and caustic applications are condemned; only the blandest should be used. The glycerite of borax is preferred. From a personal experience in diphtheria the great superiority of hot over cold applications and gargles is emphasized.

In the case of children too young to gargle, equal parts of borax and sugar are used dry upon the tongue, a small amount being used hourly.

The forcible examination of the throats of children, or local applications which have to be made by force, are alike condemned, not only from the terror and exhaustion which ensues, but from the danger of the inspiration of infectious masses into the larynx and lungs during the violent straining- and screaming-fits which are produced.

Free use of stimulants and plenty of fresh air are indispensable. All the writer's points are illustrated by numerous clinical cases.

Nicholson: A Second Attack of Mumps with an Interval of Six Weeks between the Affection of the Two Sides. (*Lancet*, January 5, 1889.)

There is nothing of interest in the case except the fact referred to. Both attacks were quite typical. The family seemed to possess a peculiar susceptibility to infectious diseases.

The patient and all her brothers and sisters (a large family) had had measles twice, one a third attack; and one had two attacks of varicella.

Wright: Case of Obstruction to Respiration probably due to an Abscess from a Broken-Down Bronchial Gland. (*Lancet*, September 29, 1888.)

The patient was a boy, aged twelve years. The history was as follows: three days previously, exposure, followed by rigors, cough, dyspnoea, aphonia, and restlessness. The lungs were quite healthy, and the temperature only 101° .

Examination of the throat was normal. The symptoms grew worse; every now and then paroxysms of dyspnoea came on, which threatened quickly to terminate life. Tracheotomy was performed. The tube worked well, but it was evident

that the obstruction was below it; and no relief followed. Several hours later, while the boy was in nearly a pulseless condition, a gum-elastic catheter armed with a stylet was introduced into the wound and passed downward. It came upon an obstruction above the bifurcation of the trachea.

The possibility of a foreign body being thought of, the catheter was pushed forcibly onward. There was at once a gush of pus from the tracheal wound. The boy's condition at once began to improve. He had no bad symptoms. The discharge from the wound and the expectoration with the cough continued free for several days.

The author believes that the ailment from which the boy suffered was an abscess arising in one of the bronchial glands pointing into the trachea, which was ruptured with the end of the catheter.

Simon: Differential Diagnosis of Tubercular Meningitis. (*El Prog. Gin. y Ped.*, September 25, 1888.)

1. From typhoid fever. This fever may suggest meningitis, at the beginning; by reason of the cephalalgia, vomiting, and constipation which attend it. But meningitis is decidedly distinguished by strabismus, inequality of the pupils, alternate pallor and redness of the head, changes in the respiratory rhythm, and intermittency of the pulse. In typhoid fever, after the eighth day, the abdomen is distended and has lenticular spots upon it. In meningitis the belly is depressed and there are no spots on it.

2. From pneumonia. In both diseases there are, at the beginning, cephalalgia, nocturnal agitation, convulsions or convulsive movements, prostration, and vomiting. But within twenty-four hours, at the most, the respiration in pneumonia has become very rapid, there is a dull percussion-note upon the chest, and diminution of the respiratory murmur. The temperature rises rapidly to 39.2° to 39.4° C., and the pulse to 140 to 160. In meningitis none of these phenomena are observable, the temperature remains under 39° , and there is no fixed relation between temperature and pulse.

3. From the eruptive fevers. At the beginning of these fevers there are phenomena of cerebral congestion which render the diagnosis very difficult. If, however, the case be scarlatina or measles, the angina connected with those diseases will reveal their nature, and enable one to make a diagnosis within twenty-four hours.

If there is no eruption or angina the diagnosis will be difficult. An abrupt beginning is not characteristic of meningitis. Within two or three days the peculiarities of pulse and tem-

perature and the respiratory rhythm will show the nature of the disease. In meningitis the pulse is irregular, unequal, and intermittent, and bears no fixed relation to the temperature. After eight days the peculiar phenomena of meningitis are usually well developed.

4. From intermittent fever. Pernicious intermittent fever is rarely seen in children.

5. From cerebral sclerosis. At the beginning of this disease there are cephalalgia, insomnia, vomiting, and convulsive movements. These phenomena continue one or two days, and then the condition is apparently normal again. Some months later they are repeated with greater persistency. The vomiting increases, being spontaneous, the tongue is saburral, and there is constipation.

A. F. C.

Hadden, W. B.: The Knee-Jerk in Diphtheria: Is it of any Diagnostic Value? (*Lancet*, January 9, 1889.)

The writer draws attention to the fact that paralysis is much more frequent during the acute symptoms of diphtheria than is generally supposed. The same applies to the knee-jerk, which, although sometimes exaggerated, is more often lost. He relates two cases, in one of which the only nervous symptom following severe diphtheria was loss of knee-jerk. However, as this patient developed tubercular meningitis about two months afterwards, this case is not quite a clear one.

In another case a girl was admitted to the hospital with symptoms of diphtheria, but without any membrane visible. From the absence of knee-jerk the case was believed to be one of diphtheria, and this diagnosis was confirmed by the autopsy.

Murray: Cerebral Hemorrhage in a Child. (*Lancet*, September 1, 1888.)

The child, aged nineteen months, came under observation for subcutaneous nævus. This was incised, and two days later she contracted scarlet fever. During convalescence the child was taken with high temperature and symptoms of peritonitis. She died two weeks later.

A post-mortem examination showed no trace of peritonitis. Brain: venous congestion of the anterior one-third of the outer and under surface of the left side, and a firm clot, the size of a walnut, in the temporo-sphenoidal lobe.

The limitation of the clot was distinct, and the brain substance around was firm. It was apparently of recent origin. The left lateral sinus was filled in its posterior two-thirds by an organized clot, obviously of some date.

The symptoms in this case were entirely misleading, and,

apart from convulsions on the day of death, pointed strongly to peritonitis.

The most probable explanation is that, on account of bad drainage (the lateral sinus being blocked), together with the increased blood-pressure, a vessel gave way.

Cheadle, W. B.: *Rickets*. (*Lancet*, August 18, 1888.)

The commonly-assigned causes are subsidiary to one chief cause, viz., bad feeding. Infants fed on farinaceous diet are extremely liable to rickets. This is not due to the presence of starch, but to the absence of certain other necessary ingredients. The absence of fat was thought to be the most essential feature in the causation. Nitrogenous substances and the phosphate of lime were thought to be necessary to health. Syphilis was not regarded as having any essential bearing, though, when present, it would aggravate it. Treatment by food followed as a natural sequence. Rickety children were overdressed. Milk and cream and raw meat were regarded as preferable to cod-liver oil and iron.

Oliver: *Malformations of the Heart. Report of Clinical Cases, and Pathological Specimens*. (*Brit. Med. Jour.*, January 5, 1889.)

CASE I. was a boy of four years, with marked cyanosis, clubbing of fingers, and dyspnoea. Cyanosis had not been marked until he was two years old. The physical signs showed enlargement of the heart, specially of the right side, and a systolic murmur with the maximum point of intensity at the junction of third left intercostal space and the sternum. It was transmitted along the pulmonary artery for an inch and a half. A diagnosis of "some communication between the right and left chambers of the heart" was made.

A report of three post-mortem specimens is given, the patients dying in adult life. In the first specimen there was an open foramen ovale admitting a large catheter, but somewhat oblique. There was dilatation of the right ventricle and tricuspid stenosis.

In the second specimen the heart was much enlarged, a cribiform filled up the foramen ovale, and the pulmonary artery was greatly dilated. The walls of the right ventricle nearly one inch in thickness. The right auricle was dilated; the aorta was small. The ductus arteriosus is not mentioned.

In the third specimen there was an interventricular communication, admitting two fingers, situated just below the aortic valves.

The aortic and mitral valves were healthy, the ductus arteriosus patent at either extremity, but the channel occluded.

There was marked pulmonary stenosis. The right ventricle was as thick as the left; a loud blowing murmur was heard during life at the mid-sternum internal to the apex, but not conducted in any direction, but was heard at the base of the left lung. The patient had suffered from cardiac symptoms from childhood.

Elliot: Exfoliative Dermatitis in the New-Born. (*Rev. Mens. des Mal. de l'Enf.*, October 1, 1888.)

This disease had received very little attention until it was described by Ritter, in 1878. It is also called Ritter's disease, and has recently been studied anew by Elliot. The disease is preceded by a dry and scaly condition of the skin, and begins with a redness in the lower half of the face. Then it extends to all parts of the body, the color of the skin varying between a pale red and an intense purple. As the eruption extends exfoliation takes place of those portions of skin which were first involved. This may take place without any evidence of exudation, the subjacent tissues being covered with a fine layer of new epidermis. The exfoliation may also be preceded by the appearance of small vesicles. Then the horny layer of epidermis situated above the hyperæmic surface is undermined by a liquid exudate, forming large bullæ. After exfoliation is completed regeneration begins, and the skin remains scaly and irritable for some time. The disease runs its course in seven to ten days. In typical cases there is no fever. The result of the disease is frequently fatal, either on account of the gravity of the form or of intercurrent diseases. The disease is to be differentiated from pityriasis rubra, in that the latter has no bullæ or exudation; from the dermatitis exfoliativa of Wilson, in that the latter is always accompanied by fever; from erythema of the new-born and infantile erythema, in that the first of these occurs only on the first day after birth and is not followed by desquamation, while the second usually precedes a febrile and inflammatory disease. Erysipelas is usually circumscribed, the affected areas being swollen, and the general phenomena also serve to differentiate it from this disease. Acute eczema of the new-born is usually accompanied by constitutional disorders and many cutaneous phenomena; the scales do not come away readily and are thickened by the exudate. Exfoliative dermatitis is also distinguished from chronic eczema by the slow course and scaly form of the latter. In distinction from pemphigus vulgaris, the disease under discussion is usually benign, and it does not begin with a diffuse redness but by an eruption of round or oval bullæ of various sizes upon the entire body. The dis-

tion from syphilitic foliaceous pemphigus is that the latter is always bullous, is usually limited to the palms of the hands and the soles of the feet, is very slow in its course, and is accompanied by the other symptoms of syphilis. In distinction from the febrile exanthemata, the latter have their characteristics clearly marked, their peculiar course, and method of desquamation. The treatment is limited to protecting the skin from all irritation during the period of desquamation, the parts being enveloped in cotton upon which ointment or antiseptic oil has been placed. Alimentation should be carefully provided for, and laxatives used as indicated. As to the pathogenesis of the disease, the theories of Ritter and Kaposi are rejected and that of Kaspary is accepted,—namely, that the disease is an epidermolysis of unknown nature, followed by secondary hyperemia. It is probably an acute disorder of nutrition in the superficial layers of the skin which do not contain blood-vessels.

A. F. C.

Stephan: Facial Paralysis in the Newly-Born. (*Le Concours Méd.*, September 15, 1888.)

At least three different forms of peripheral facial paralysis have been observed:

1. Paralysis caused by the application of the forceps.
2. Paralysis caused by a slow labor, with faulty formation of the pelvis, or an intra-pelvic tumor.
3. Paralysis which is usually accompanied with diminution in the power of hearing, and is usually due to congenital defect.

While the first two of these varieties have a good prognosis with regard to ultimate complete cure, the third is entirely incurable. The functional troubles which accompany the latter are not great, because the child learns to accustom himself to his condition, and because he has never known what it was to have a normal condition upon the paralyzed side. When an accoucheur finds a case of peripheral facial paralysis which is not due to the use of the forceps it is well to give a guarded prognosis, as the condition will disappear if it is due to pressure, but it will persist if really congenital.

A. F. C.

De Armond, J. A.: Diphtheria. (*Medical Register*, March 2, 1889.)

The author deals chiefly with the prophylactic and curative treatment. He refers to the etiology merely to show that there is no known cause for the disease.

In the prophylactic treatment he regards perfect health as

of paramount importance, and where this is impaired the vital powers should be built up. Next to this he places isolation. If this cannot be accomplished, as in poor families in small rooms, he then advises fresh air, wholesome food, warm clothing, thorough ventilation of sleeping-rooms, avoidance of sore throats, and some mild, harmless substance, as chlorate of sodium. The use of whiskey he opposes in the strongest terms, but chiefly from a moral point of view.

In the curative treatment he gives the first place to abundant assimilable food, chiefly milk at regular intervals; to this he adds, control the fever, limit putrefactive absorption by the use of membrane solvents that are not destructive, and, above all things, do not use whiskey. He claims the death-rate will be lower without a stimulant than with it.

Herringham, W. P.: Chorea and its Relation to Rheumatism. (*Lancet*, January 12, 1889.)

Eighty cases are reported; acute rheumatism preceded the attack in nineteen cases, immediately in four, at some interval in fifteen. It accompanied the chorea in two cases. The total number of cases in which rheumatism of some sort could be traced was thirty-seven. Inquiry had, however, been restricted to arthritis, that the evidence of other more equivocal symptoms might not be rejected by the sceptical. Injury, shock, or violent emotion preceded the attack in six cases, the interval never being greater than two days. Nearly all the patients were delicate. Headaches and indigestion were the most common complaints.

The family history was calculated from parents, brothers, and sisters. Rheumatic fever had occurred in twenty-five out of seventy-five families; chorea had occurred in twelve families, nine of which were also rheumatic.

The state of the heart throughout the disease was natural in ten cases, uncertain in twenty-five, certainly diseased in twenty. Signs of disease developed during observation in eleven cases, and signs at first present vanished in four. Thirty-seven cases seen after two years presented for the most part the same signs. Of the doubtful cases, two had become healthy, seven were certainly diseased. Of the cases which developed signs during the attack, five were re-examined. Two were natural, three diseased.

The following conclusions were drawn: 1. That a large number of choreic patients were liable to rheumatism. 2. That choreic patients were nearly always of a delicate constitution. 3. That chorea was sometimes directly caused by emotion. 4. That chorea might cause permanent heart-dis-

ease. 5. That it also gave rise to signs of heart-disease which were not permanent.

Garrod, Archibald: The Relation of Chorea to Rheumatism. (*Lancet*, January 12, 1889.)

Eighty consecutive cases are reported by this author, sixty-one of the patients being females and only nineteen males. The average age of the females was considerably higher than that of the males. Forty-nine were suffering from first attacks. There had been rheumatic fever in the near relatives of twenty-six patients, rheumatism with swollen joints in those of three, and rheumatism in three more,—a total of thirty-two, or forty per cent. The tendency to chorea was more marked in some rheumatic families than in others. There was a personal history of rheumatic manifestations other than endocarditis in thirty-six cases, or forty-five per cent. In fifteen of these there was a definite history of rheumatic fever; in nine of rheumatism with swollen joints; in one of joint-pains, confining the patient to bed; and in nine of joint-pains only. Some had an attack of chorea with joint-pains only and a later attack of well-marked rheumatic fever. Other cases are quoted, having no family history of rheumatism and no history of joint-pains, who had previously suffered from chorea. During the course of a second apparently non-rheumatic attack, erythema nodosum and arthritis had developed. In fifteen cases the onset was ascribed to fright, but this had not always been substantiated. A definite murmur was heard in forty-five cases, or fifty-six per cent. The percentage of murmurs was highest in those with personal histories of rheumatism. The opinion was expressed that the endocarditis of chorea was always of rheumatic origin, but that we had no evidence to show that all chorea was of rheumatic origin, a considerable number of cases being probably due to emotional and other causes.

In the discussion of this paper and that of Dr. Herringham, Dr. Cheadle expressed surprise that injuries had been limited to the presence of arthritis. Arthritis is in many cases so slight that statistics concerning rheumatism based upon that symptom alone must be inadequate. Fright was an effective cause in rheumatic and non-rheumatic cases; but he believed that a much larger proportion of cases of chorea was rheumatic than were generally supposed.

Dr. A. E. Sansom believed that there was a fright chorea dissociated from rheumatism, yet many cases apparently non-rheumatic become plainly rheumatic later on.

Dr. Sturges believed there was a real relation between

chorea and rheumatism, but was doubtful as to its amount and extent; he thought there was a tendency to exaggerate this relationship. He believed there was some relation between chorea and the joint-pains so commonly associated with it, but did not think those pains were always rheumatic.

Dr. Barnes alluded to the relationship between chorea and pregnancy, and related a case where a child had chorea and was cured, but in later years becoming pregnant, the chorea returned. The pregnant state was one of high nervous tension, and chorea thus developed often tended to insanity.

Dr. S. Mackenzie thought that the evidence lately had become increasingly strong that rheumatism played a great part in the production of chorea.

Dr. R. J. Lee thought there was no evidence of cause and effect between chorea and rheumatism, though the two frequently coexist.

Ophthalmia in London Schools. (*British Medical Journal*, December 8, 1888.)

This malady had at one time decreased, but is now increasing at a rapid rate, and it is thought necessary that ample means should be adopted for its isolation. Over thirty thousand pounds are to be expended for that purpose.

The Treatment of Scarlet Fever by Mercuric Iodide. (*British Medical Journal*, January 19, 1889.)

Dr. Purdy had tried this treatment in fifty cases with but one death. The temperature fell rapidly, the symptoms improved, and desquamation was slight. The average period of isolation was eighteen days. There were no lingering sequelæ. The formula used was liq. hyd. perchlor., ʒi ; pot. iodid., ʒss ; symp. ad., ʒviii . Half an ounce to be taken every one, two, or three hours.

Dr. Cameron had lately had eighty cases without a death, where no special medicinal treatment had been employed, and hence thought it hard to dogmatize on the subject.

Mr. Hick had treated fifty cases with mercuric iodide. Except that there were more cases of nephritis than usual, he could detect no special effect from the drug.

Dr. Jacob, as physician to the Leeds Fever Hospital, had seen a large number of cases, and lost faith in any specific treatment, but he thought the local treatment of faucial and nasal conditions very important for the comfort of the patient.

Dr. Rumball had recently treated thirty-six cases by this method; seven had nephritis; two died. He had seen no special advantage in it.

Wiley, C. H.: *The Morbid Anatomy of the Scarlatinal Kidney.* (*Lancet*, January 19, 1889.)

The author thought it had been too much taken for granted that in scarlet fever convalescence nephritis is closely indicated by albuminuria, and that the presence of albumen meant nephritis.

In studying scarlatinal kidney all cases should be examined; not those alone which were accompanied by albuminuria. Microscopic specimens were shown forming a series exhibiting progressive tissue-change from the fourth to the fortieth day. The first sign of interstitial affection appeared by small cell-infiltration of the fine connective tissue in connection with the vascular structures in the cortex, the afferent arterioles, and Malpighian bodies. On the eighteenth day the changes were more advanced, with addition of thickening of the walls of the arterioles, due, the author thought, to swelling of the middle coat. Specimens from the case fatal on the fortieth day showed changes described by Klein and Greenfield as glomerular nephritis; but, in addition, the fine connective tissue among the capillary bundles of the glomerular tuft had also proliferated, and split the tuft into sections, each of which was destroyed by the subsequent contraction of the new tissue. Glomerular nephritis is a rare and fatal disease. He believed that the majority of cases of albuminuria, after scarlet fever, were not associated with actual inflammation of the kidney,—i.e., that albuminuria did not necessarily show that the kidney is the seat of mischief.

Owen, Isambard: *The Geographical Distribution of Rickets and Chorea.* (*Lancet*, January 19, 1889.)

The report of the Collective Investigation Committee shows that rickets, though not unknown in rural regions, is mainly a disease of towns and industrial regions, and especially of large industrial towns. Chorea, like rickets, is mainly a disease of towns and industrial regions, though by no means unknown in rural districts. Its distribution is affected by that of acute and subacute rheumatism, its prevalence diminishing as the latter disease becomes rare.

Spear, John: *Observations on the Etiology of Diphtheria.* (*Lancet*, January 26, 1889.)

Two severe epidemics of diphtheria have occurred in Aylesbury since 1885. Careful observations were made concerning their origin, but with very uncertain results. During the interval between the two outbreaks "simple sore throat" was very prevalent, as was also catarrhal rhinitis with offensive discharge. These attacks were multiple,—a fact which pointed to their in-

fectiousness, but were in no instance followed by paralysis. They markedly decreased in frequency upon the outbreak of the second epidemic. That a connecting link of throat lesions did unite these two outbreaks in point of time is unquestioned, but after weighing the evidence no definite opinion was formed as to their precise relationship.

Concerning the influence of personal infection, the course of the epidemic was strongly indicative of some slowly progressive mischief, such as would be supplied by a multiplication of foci of such infection, yet there were no less than thirty per cent. of the attack in which no history could be obtained of previous exposure.

Whitelegge, B. A.: The Incubation of Scarlet Fever. (*British Medical Journal*, January 26, 1889.)

The author takes exception to Trousseau's view that inoculation is the only means of determining the latent period of a disease, showing that the period of inoculated diseases is not always constant, and is usually shorter than that of the same disease acquired by other means. Reliance must be placed mainly on the observation of individual cases. The estimates given by earlier authorities are much too long, the range often being so wide as to be useless for guidance in practice. It becomes important, therefore, to discover if there be not some well-marked usual period which shall hold true for the great majority of cases.

After reviewing the evidence the author believes that the usual period of incubation is three days, or, at least, between two and four days; and that it is rarely less than one day, and very rarely more than seven days.

Booboyer, Philip: Infantile Remittent and Enteric Fever. (*British Medical Journal*, January 26, 1889.)

Mrs. J. B. was taken ill with enteric fever on October 1. Her baby, eight months old, exclusively breast-fed, was noticed on October 3 to be suffering from slight diarrhoea. Two days later the child was taken away by an aunt whose family consisted of eight persons. Five of these were attacked with enteric fever between October 28 and November 4. The baby had continued to be fretful and ill, and at times the diarrhoea had been profuse. The water- and milk-supply were good, and the hygienic surroundings were excellent. There was no other case in the vicinity.

As the nature of the child's complaint was unsuspected, no precautions whatever were taken against infection. It was unhesitatingly concluded that the family was infected by the baby, a child eight months old.

Owen, S. H.: Enlargement of the Spleen. (*British Medical Journal*, January 26, 1889.)

The condition of splenic anæmia, the author thought, was not infrequent in children, and was largely due to the disturbance of the blood-forming process, brought about by a great variety of diseases. He reported the case of a boy, eight years old, who had been under observation three years. The spleen had at one time reached the level of the umbilicus. A systolic murmur had been noted at the apex of the heart, audible only in the recumbent position,—a peculiarity frequently observed in anæmic conditions. Great improvement had taken place under the prolonged administration of iron and arsenic.

III.—SURGERY.

Collier: Tracheotomy. (*Lancet*, December 22, 1888.)

It is sometimes necessary, in cases of great urgency, to make an incision into the trachea before it has been exposed to view. While an incision may usually be made at once into the trachea without difficulty, owing to the anatomical arrangement of the layers of fasciæ it is not always easy to insert the tracheotomy-tube. Three distinct layers of fasciæ are usually found over the trachea connecting the various muscles. If an incision be at once made without clearing these away, slight movements by attempted inspiration will so displace the parts that the incisions through the various layers will no longer be exactly superimposed. Hence the difficulty of inserting either a dilator or a tube and the frequency with which the tube is pushed down in front of the trachea.

The author presents a dilator designed to overcome these difficulties. It is a scissors-shaped instrument, with blades curved upon the flat. Along the convex surface of each blade is a half-groove. These half-grooves, when the instrument is closed, form a full groove, forming a curved, grooved director.

In performing the operation, the patient's head being thrown well back, the usual incision is made and carried well down between the sterno-hyoid muscles. If extreme rapidity be demanded, the knife, held perpendicularly, with its back towards the sternum, and guarded from going too deeply by the index finger placed on the side of the blade, is pushed into the trachea. The incision is then made of sufficient size, and before removing the scalpel the groove on the dilator is applied to the back of the blade, and, with this as a guide, the dilator is slipped down into the trachea and the scalpel

withdrawn. The dilator being opened, the tube is easily slipped into place along the half-grooves. This can be very rapidly done. The bleeding usually ceases upon introduction of the tube, and is rarely troublesome.

Doyle: A Coin retained in the Œsophagus Four Months. (*Lancet*, November 10, 1888.)

The patient, a strong, healthy boy, four years of age, had, while playing, swallowed a halfpenny. An emetic was immediately administered, but it was ineffectual. Four days later there had been several movements of the bowels, but the coin had not been passed. He had cried frequently, and complained of pain, which he located at the middle of the sternum, and was restless night and day. The parents objected to the use of an instrument. Several days afterwards he appeared much better, but on swallowing still complained of pain behind the sternum. After a few weeks the pain entirely ceased. After four months, while eating a cake, he hiccoughed violently and brought up the coin, which had turned quite black.

Hardwicke: Fœtal Malformation. Absence of the Cerebrum. (*Lancet*, November 17, 1888.)

The mother had been married six years; had had one child four years previously; no miscarriages, and no history of syphilis. During labor, as the os dilated, the examining-finger passed through it into space. Later a basin-shaped cavity could be felt, with hard, serrated edges. Delivery was accomplished without serious injury to the vaginal passage.

The parietal and frontal bones and the cerebrum were found to be entirely absent. The occipital bone was complete. Within the basin of the calvaria was found the smooth surface of the dura mater, covering the inner surface of the bones, cerebellum, and orbits, the eyes being beneath in their normal position. Detailed investigation by dissection was refused.

Queely, E. St. George: Gangrene of the Labia. Noma. (*Lancet*, January 12, 1889.)

The patient, a girl of nine years, had measles four months before the illness reported. She was left delicate and anæmic after the attack. No other cause was known. There were in the beginning the ordinary signs of cellulitis present, but sloughing took place without suppuration. The local symptoms were distressing in the extreme; there was also profound constitutional disturbance, delirium, etc. Absolute cleanliness, the solid stick of nitrate of silver, and carbolized zinc oint-

ment were applied. The last seemed to afford the most relief. After about ten days' illness improvement began, and by the sixteenth day convalescence was established.

Hartshorn: Case of Malformation of the Rectum. (*Lancet*, September 1, 1888.)

The child was six months old. The fæces had passed through the vagina since birth. There was no orifice externally. The child had been operated upon superficially several times, but unsuccessfully. When the bowels were about to move the child suffered great pain, and strained to such a degree that she became nearly black in the face.

By the use of a small silver catheter an opening was found leading from the vagina into the gut.

The child was placed in the lithotomy position; the catheter was passed from the vagina into the gut; an incision one inch in depth was made down to the catheter, and afterwards enlarged as much as was deemed necessary. The catheter was then brought out through the opening. A piece of tape saturated with oil was drawn through the incision and through the opening in the vagina by means of the catheter. Directions were given to draw some of the tape through the incision when the bowels were about to be moved. The result was that from the first, part of the fæces followed the tape, while the remainder still continued to pass through the vagina; but by perseverance in this way the discharge through the vagina became less daily, and more passed by the opening made. A good external orifice having been established, the tape was withdrawn. The result was perfectly satisfactory. The vaginal orifice closed, and a complete recovery was effected within six weeks from the date of operation.

Hyde: A Case of Recurrent Fibro-Sarcoma of the Thigh. (*Lancet*, October 27, 1888.)

When the boy was one year and a half old there was noticed a tumor growing on the posterior surface of the thigh. This was removed, and was found to be not adherent to the bone. Soon after the wound had healed a fresh tumor appeared in the same situation, and continued to grow for five years. There was no pain, but there was considerable inconvenience in walking. The left hip cannot be fully flexed, but it can be extended. The left knee can only be flexed to a right angle, as it then comes in contact with the lower edge of the tumor. The tumor is smooth and tense. The hamstring muscles, sartorius, and rectus can be traced easily over the surface. The limb was amputated through the trochanters in such a way

that the angles of the wound occupied the same position as in an amputation by transfixion at the hip-joint. One year after the operation there was no sign of recurrence. Upon examining the tumor it was found that the muscles, vessels, and great sciatic nerve were spread out over the surface of the tumor. The tumor was not adherent to the bone in any situation. On section the growth was found to consist of distinct lobes, the lobes being again divided by fibrous trabeculae, which branched in all directions, the spaces between them being occupied by a greasy-looking yellow material.

Microscopically, it was found to consist mainly of masses of fat separated from each other by strands of connective tissue containing a large number of small spindle-shaped cells. The tumor weighed twelve and a half pounds and the limb five pounds, making together seventeen and a half pounds; being just over one-third of the weight of the whole patient. The recovery of the patient under such conditions is worthy of record.

Delassus: Obstruction of the Trachea after Tracheotomy. (*Rev. Mens. des Mal. de l'Enf.*, May, 1888.)

The practical difficulty of dryness of the tracheal mucous membrane after a canula has been introduced has been observed by many distinguished writers upon the diseases of children from Trousseau to the most recent. The literature of this subject has been well sifted by the author, his own observations have been added, and his conclusions are the following:

1. Aside from the well-known complications of tracheotomy, such as obstruction of the canula, broncho-pneumonia, pseudo-membranous bronchitis, there is another, which has seldom been described,—obstruction of the trachea under the canula from drying of the products of secretion of the respiratory passage.

2. The introduction of warm and very moist air will prevent drying and bronchitis, the latter being the principal cause of profuse secretions.

3. The production of vapor in the sick-room by the constant boiling of water is the most simple, rational, and certain means of obtaining the necessary warm and moist air. It is preferable to the atomization, inhalation, and moist compresses which have been recommended.

4. If obstruction has been produced it should be treated with instillations of warm water, tickling the trachea with a feather, and careful saturation of the atmosphere with watery vapor.

A. F. C.

Vincent: Proceedings of the National Society of Medicine of Lyons. (*Arch. f. K.*, x. 2.)

Vincent demonstrated an anatomical preparation consisting of an impervious œsophagus, the pharynx ending in a *cul-de-sac*, while five millimetres below the œsophagus, and contiguous to it, the trachea began. The œsophagus from that point was pervious, and air injected at the pylorus distended the stomach and the œsophagus. There was also a fistula between the œsophagus and the trachea, by which air could be made to pass from the former into the latter. The child lived seven days and showed evidences of severe bronchitis, which was probably caused by the entrance of gastric juice through the fistula into the trachea and lungs during efforts at vomiting. All food which was introduced into the mouth was immediately rejected. Five cases of imperforate anus were also reported, in which modifications of existing methods of operation were adopted. If Amussat's operation is performed, and the rectum, after being drawn down, is stitched to the perineum, the sutures are apt to tear out in a few days, the rectum again retracts, and a phlegmon is wont to develop in the denuded perineal tissue. In the rare cases in which the patient does not at once die, he is apt to die subsequently from the peritoneal disease which is excited. The following is the author's recommendation for the operation: a large incision is made in the raphe of the perineum, then the finger is inserted to explore the anterior surface of the ilium and sacrum until the end of the rectum is found. It may be recognized by its dark color. Then the surrounding tissue is torn so that the rectum may be made movable, after which it is drawn down. Next the incision is lengthened as much as is necessary towards the border of the ilium or sacrum, and fixes the ampulla of the rectum in a position in which it will not retract. If the end of the rectum is far from its normal position it may be necessary to make the artificial anus at the level of the third or fourth sacral vertebra. Two small oval pieces of skin are then removed on each side, which will prevent subsequent contraction of the scar. One need not fear the unavoidable wounding of the fibres of the external sphincter, for in fact the latter is usually absent in this deformity, and the closure of the anus is effected by the internal sphincter. The still closed gut is then secured with catgut sutures for a distance of three centimetres from its extremity, and then the gut is opened. The wound is then cleansed and the borders of the gut are sutured to the skin. This operation is preferable to colotomy, and was successful in all the author's five cases.

A. F. C.

Flathmann: Operations for Cephalocele. (*Arch. f. K.*, x. 2.)

The bad prognosis of cephalocele in general, and of cases which are operated upon in particular, justifies the author in publishing the history of a successful operation. The newborn child with this condition, which was seen immediately after birth, labor having been normal, came of a family in which deformities had not occurred. The child was a boy and was normal, with the exception of the cranial tumor. One centimetre below the occipital protuberance was a roundish tumor with a pediculated base, as large as the child's head and directly continuous with the skin of the head. The tumor fluctuated, was transparent, bluish in color, and could not be made smaller by compression. The latter produced no brain symptoms. No gap in the occipital bone could be found as a means of communication between the interior of the cranium and the tumor. The pedicle was transfixed and ligated in two parts. The sac was then cut away and the wound sutured and dressed. In ten days the patient was well and showed a normal cranium. The contents of the tumor were serous, albuminous, and bloody. The wall was composed of skin externally and pia mater internally. The dura only extended a short distance into the cyst wall. The inner wall also contained a lobular portion of tissue which belonged to the tela choroidea. A year and a half after this operation the child was again seen, and an enormous hydrocephalus was present, with the sagittal suture a finger's breadth in width. Just under the scar resulting from the operation was a depression as large in area as a twenty-five-cent piece, which was evidently the hernial opening of the hydromeningo-encephalocele.

A. F. C.

Beach: Lacerated Wound of Brain. (*Lancet*, October 27, 1888.)

The boy was injured with a window-pole, which entered the brain to the extent of about one inch, two inches and a quarter above and one inch to the right of the occipital protuberance. He was conscious when seen, but was evidently suffering from shock. When the dressings were removed, the next morning, a hernia cerebri was seen. The antiseptic dressing was re-applied and an ice-bag ordered. Next day the hernia cerebri had disappeared and the hole in the scalp and skull was filled with blood-stained brain-matter. Eight days after the accident another hernia cerebri appeared, but disappeared two days later. The patient developed symptoms of meningitis, which disappeared, and the wound healed. Nineteen days

after the injury he again became restless and the temperature began to rise. On the twenty-seventh day an abscess broke through the closed wound and a quantity of pus escaped. The wound closed up again. Six weeks from the time of injury an abscess appeared in the left thigh. One month later the boy was up and about.

Two things were noticeable in this case: first, there was no paralysis, because the motor parts of the brain were not involved; secondly, when the boy recovered he took up his lessons again where he had left them off, showing that his intellect had not suffered.

Williams, Watson: Tracheotomy-Tube worn for Thirty-six Years. (*Brit. Med. Jour.*, January 5, 1889.)

The patient, a man who was shown at a medical society, has worn the tube for the length of time stated, on account of laryngeal stenosis. He got about in bad weather without any inconvenience, and remained singularly free from pulmonary symptoms.

Besnier: Stercoral Typhlitis, especially in the Young, and the Peritonitis which accompanies it,—Primary Perityphlitis. (*Rev. Mens. des Mal. de l'Enf.*, May, 1888.)

The following conclusions embody the author's views:

1. From an anatomical stand-point, stercoral typhlitis may take the phlegmonous form (Duguet). In this form inflammation attacks the cellular tissue underneath the mucous membrane of the cæcum, and gives rise to a true phlegmon, which is developed without, of necessity, a perforation of the intestine, and is terminated by suppuration or gangrene. Even in the latter case a cure may occur if the sphacelated portions are eliminated with the stools.

2. From a clinical stand-point, whatever its anatomical form may be, stercoral typhlitis may appear abruptly, and be accompanied, from the beginning, by peritonitis which is localized in the region of the cæcum, and of which the symptoms become suddenly conspicuous. These cases, which are more common in young persons than in adults, have been considered by certain authors as idiopathic phlegmons, and described as cases of primary perityphlitis. Their proper nomenclature is typhlitis and peritonitis, or typhlo-peritonitis, which is peritoneal from the beginning. In these cases typhlitis and peritonitis form, as it were, only one disease, the progress of which is acute, and the termination of which is preceded or accompanied by more or less abundant intestinal evacuations, resolution being attained in most cases.

3. From a comparison of the foregoing with cases which are referred to as secondary perityphlitis, it appears that under the last-named classification are included two kinds of accident, which differ with respect to the seat of the perityphlitic inflammation: 1. Cases of circumscribed peritonitis, which may be simple, or may be accompanied by phlegmon in consequence of the propagation of the inflammation from the peritoneum to the neighboring cellular tissue. 2. Phlegmonous inflammations beginning in the retro-cæcal cellular tissue and accompanied by partial peritonitis. The first inflammatory form of typhlo-peritonitis, whether simple or complicated with a phlegmon, includes most frequently cases of benign and resolvable perityphlitis. The latter form is rare, and constitutes what is properly called perityphlitis. For better differentiation it might be called typhlo-cellulitis, which, by indicating its seat and nature, would remove confusion between the different forms of perityphlitis.

A. F. C.

Wright, G. A.: Arthrectomy. (*Lancet*, December 1, 1888.)

The operation is chiefly applicable to the knee-joint, though the author has performed it upon the ankle and elbow. In joints with complex bony surfaces, or where free mobility is an important element, the operation does not promise a great measure of success. The transpatellar method is the best, drainage being through the back of the joint. The results in successful cases are better than those of excision, in that there is no shortening whatever, while a firm, stiff, straight limb is obtained. Mobility, though possible, is not to be counted upon. The operation is not applicable to cases where there is wide-spread disease of the bone, or where there is much suppuration, or general tuberculosis. It is chiefly applicable to children.

The noticeable points of the operation are: 1. Full exposure of every cranny of the joint. 2. Absolutely complete removal of all disease. The use of the cautery is often required. 3. The crucial ligaments should be preserved, if possible, as they tend to steady the joint afterwards. 4. The limb should be well fixed till healing is complete. A knee-splint may be then applied, or the limb may be fixed in plaster of Paris. 5. As in excision, flexion will occur unless the limb is kept fixed for at least two or three years.

Poland, John: A Case of Imperforate Anus. (*Lancet*, December 29, 1888.)

The child at the time of the report was nine months old. When twelve hours old he had been operated upon for imper-

forate anus. The rectum opened into the membranous portion of the urethra, and feces had passed through an opening immediately in front of the scrotum. Hypospadias was also present. The rectum was easily found, brought down, and united to the skin. The motions now pass through the anus.

Ayres, Samuel: Paracentesis in Internal Hydrocephalus. (*Medical Register*, March 23, 1889.)

The case which the author reports is that of a boy five years of age; height, three feet one and a half inches; weight, forty-three pounds; family history good. The boy was healthy until he was three months old, when, without any known cause, he was seized with convulsions during sleep. These attacks recurred with great frequency for nine months. They then ceased, and have not returned. Three months after their commencement his head enlarged and became pear-shaped, the greater diameters corresponding with the biparietal parieto-occipital planes. There was no separation of the cranial bones. When the author first saw him, in October, 1888, his condition was obviously imbecile; there was little or no mental development, he could not talk and was totally blind, but his other special senses were not affected; had never walked or stood alone, but could easily move his body and extremities; the bowel and bladder sphincters were not controlled; he was irritable, restless, and slept irregularly; he could take only liquid food, given from a spoon. He was fairly developed and well nourished, but always of an ashy pallor. There was frequent rotary movement of the head, with slight retraction and grinding of the teeth; pulse 120 to 140; temperature not taken. Head measurements from glabella to inia twelve and a half inches; over bicauricular line thirteen and three-fourths inches; around fronto-occipital line twenty inches. The anterior fontanelle closed at eighteen months and the sutures were ossified. The eyes were not examined.

A diagnosis of ventricular effusion was ventured. As every treatment had been faithfully tried, and the parents desired surgical interference, the author did the following operation of December 4, 1888: Strict antisepsis was observed throughout. Over the coronal suture, one and a half inches to the right of the median line, a small flap of the scalp and periosteum was reflected; with a trephine, about one centimetre in diameter, a button of bone was removed, which was slightly thicker than normal. The dura mater looked healthy and pulsated. A delicate trocar was passed through the dura mater and brain-substance, downward, backward, and inward,

to the depth of two and a half inches, to pierce the central cavity of the right lateral ventricle. No reflex movements of any kind occurred. Removing the trocar, a clear limpid fluid began to ooze drop by drop from the canula. About an ounce was evacuated, and as the canula was removed and its internal orifice reached the subdural space, the fluid again flowed, showing its presence in excess in this space also. Its analysis showed a close resemblance to the cerebro-spinal fluid. An antiseptic dressing was applied; for several days the same fluid oozed from the dural puncture and saturated the dressings; from four to eight ounces were thus discharged. The case progressed satisfactorily, the pulse never exceeded 140 and the temperature 101.8° . In two or three days the child was up and stood alone, and in three weeks walked alone. The sight was partially restored, he slept better, took solid food, was less irritable, and the rotary movements of the head ceased. There is no development of speech, and the sphincters are still uncontrolled. Improvement continued until the latter part of January, when, after some slight ailment, he gradually lost the power to walk. Thinking fluid was reaccumulating, another operation was appointed for February 8, but on February 5 improvement again occurred, and it was postponed. The author thinks more fluid will have to be evacuated, as he is becoming less active.

The author holds that this operation is of importance in the case of imbecile children, the commencement of whose trouble dates back to some acute or subacute cerebral trouble, as simple meningitis, or convulsions, or perhaps slight traumatism, but whose cases have been considered incurable. Such cases fill our institutions, and it is probable that this excess of fluid in the cerebral ventricles or subdural spaces, or both, may not only have caused, but perpetuated these undeveloped brains and minds. The fluid, by change of body position or blood-pressure, is responsible for the symptoms of pressure upon delicate nerve elements or tracts.

The author insists that this operation should be done in all such cases, but that both the ventricles and subdural space should be evacuated, as if only one is evacuated the pressure from the other will destroy the brain-substance. If pus be found, enlarge the opening and establish thorough drainage. Numerous authorities are quoted.

Beever: A Case of Traumatic Poliomyelitis. (*Lancet*, December 1, 1888.)

The case was that of a boy, aged twelve years, who had fallen in August, striking the left elbow. The arm was imme-

diately put in splints, there being a fracture of the humerus. When the splints were removed, a month later, there was paralysis of the supinator longus, biceps, brachialis anticus, deltoid, supra-spinatus, infra-spinatus, and teres major muscles. There was no anaesthesia. At the time of the report, in November, the paralysis continued, and the muscles did not react to the faradic current, but showed the reaction of degeneration.

The author considered the case to be either one of injury to the spinal roots (the fifth or sixth cervical) or of poliomyelitis. Owing to the absence of anaesthesia he considered the latter to be the true cause. An important symptom was the ability of the patient to use the clavicular part of the pectoralis major in conjunction with the sternal part in adducting the humerus, but inability to use the clavicular part in raising the arm when advanced where the muscle should act with the paralyzed deltoid. This seemed to show muscular paralysis for one movement but not for the other, which would be in favor of the physiological functional grouping of muscles in the spinal cord. There was nothing in the application of the splints to cause the lesion.

Dr. Angel Money was sceptical as to the existence of fracture, and conjectured that a spinal hemorrhage might have been the cause of the lesion, and the fall a secondary matter. Some associated movements, such as conjugate deviation of the eyes, have a separate governing centre, and the case in question could probably be explained by some such arrangement.

Cheadle, W. B.: A Fifth Case of Intussusception successfully treated by Inflation. (*Lancet*, January 26, 1889.)

The patient, a boy, aged fourteen months, had, six days before admission, been seized with severe pain, evidently in the abdomen, accompanied by vomiting and soon after by passages from the bowels of blood and slime. On examination a well-defined sausage-shaped tumor could be felt on the left side of the abdomen, extending from the hypochondrium to the iliac fossa. The invaginated portion of the gut could just be reached by introducing the finger into the rectum. In the treatment, an ordinary Higginson's syringe was used, the bowel being inflated with air until the abdomen became decidedly tense. The air was allowed to escape, when the tumor could still be felt. After repeating the inflation, only an ill-defined mass could be made out to the right of the umbilicus; and after a third inflation, no tumor could be felt in any part of the abdomen. The operation was performed under chloroform. The patient became easier after the operation, the bowels

began to act naturally, the temperature subsided, and in a week he was apparently well.

Carver, E.: A Case of Intussusception successfully treated by Abdominal Section. (*Lancet*, January 26, 1889.)

The patient was a boy, aged two years and nine months. The first symptoms followed closely the eating of an indigestible supper. Seven weeks elapsed from that time until admission. The first two were marked by vomiting of everything, the bowels passing very small quantities of feces with mucus and blood; the next two by an intermission, when he could retain a little nourishment and passed watery motions; and the last three by the vomiting of everything and the passage of mucus and blood only. Twenty-five days before admission the vomiting became stercoraceous, and five days later a swelling was noticed in the left iliac region, and six days after this a protrusion of the bowel was noticed at the anus.

An incision three inches long was made in the median line, but was later increased in size. The intussusception was of the ileo-cæcal variety, the outer layer being of a dark reddish-brown color. Efforts at reduction failed till a finger was passed into the rectum. No further difficulty was found till the cæcum was reached. Here considerable force was required, owing to the œdematous condition of the walls. Recovery was rapid, and the child was discharged in excellent condition at the end of three weeks. The case was interesting as regards the great length of time from the first onset of the symptoms. To have had recourse to enemata or inflation would have been not only useless but harmful, as either would have increased exhaustion, which was then very marked.

Giffard, D. W.: Two Cases of Ovaries congenitally displaced into the Canal of Nuck. (*British Medical Journal*, January 26, 1889.)

First case, aged six months. A small swelling was noticed in the left groin when the child was three weeks old. Under treatment it became larger and more sensitive, and finally red and œdematous, but did not fluctuate. The redness disappeared under poultices, when a careful dissection was made. An ovoid growth firmly bound by adhesion was found, with a pedicle running up the canal of Nuck. Both were removed.

Microscopical examination proved it to be an ovary, with abundant hemorrhages into the Graafian follicles.

Second case, aged five weeks. A slight swelling was first

noticed in the right groin when the child was two weeks old. At one month an oval body, the size of a bean, could be felt in the upper part of the right labium. It was freely movable, but could not be returned; was not translucent, and had no impulse on crying. The swelling rapidly increased in size; the greater part could be returned by taxis, still leaving the hard body. An incision was made, the body found free of adhesions, and easily removed. The upper portion of the wound was sutured, and healed perfectly.

Examination showed the mass to be a unilocular cyst of the ovary, with an abundance of newly-formed fibrous tissue and spindle-cells.

Yates: A Case of Intussusception. (*British Medical Journal*, January 26, 1889.)

The case was of interest, as the symptoms came on during the third week after an extensive burn, and simulated those of duodenal ulcer. The child was two years old. The first symptom was persistent vomiting, accompanied by slight tenderness in the epigastrium. No tumor could be detected.

The autopsy showed that there was slight congestion of the intussuscepted portion of the gut, but no ulceration at any point. The obstruction was not complete.

Morgan, J. H.: A Case of arrested Development of the Arm. (*British Medical Journal*, December 22, 1888.)

The child was born at full time. The right scapula was of normal size, but the humerus was abbreviated, articulating normally with a glenoid cavity. The forearm was very short, and the whole was covered with normal skin, with an excessive amount of subcutaneous fat. The index-finger was absent.

Cousins: Improved Truss for the Treatment of Infantile Hernia. (*British Medical Journal*, December 15, 1888.)

Illustrations are given of a truss having marked improvements over that formerly used by the same author. The essential part is an air-cushion held in position by bands and a light metal spring. The bands are of full india-rubber and all the metal parts are covered by the same material. Treatment should consist in supporting evenly and comfortably, for at least twelve months, the lower part of the abdominal region on either side down to the fold of the thigh. Operation for the radical cure is demanded in large ruptures when the canals are much dilated by straining or crying.

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THERAPEUTICS OF INFANCY AND CHILDHOOD.

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(Continued from April Number.)

V. INFECTIOUS DISEASES.

13. *Rheumatism.*

ACUTE articular rheumatism is a frequent disease both in infancy and childhood.

Since I made this statement fourteen years ago,* after observations extending over more than twenty years, a few authors have accepted and verified it. But the majority are still of the opinion, inherited from their predecessors, that infancy and childhood are immune or almost so. Thus it is only four years ago that Edlefsen reported to the German Congress for Internal Medicine (*Transactions*, 1885, p. 323) but eleven cases of acute rheumatism under five years, none of which was younger than two. The assertion that the disease is rare under four or under two years is frequently met with.

* A. Jacobi, "Acute Rheumatism in Infancy and Childhood," 1875, in a series of American clinical lectures, edited by E. C. Seguin, M.D., vol. i. No. 2.

Nothing can be more erroneous. The frequency of valvular diseases, mainly of the left side of the heart, in children of from four or five years to adolescence ought to suggest the frequency of rheumatism; for but few of them are due to scarlatina, almost all are secondary to rheumatism, than which there is no more frequent cause of cardiac disorder. They cannot be claimed as congenital, for the fact that but few of the foetal diseases of the heart are found on the left side, and but a small number survive the first (or perhaps second) year, remains undisputed. Nor is the number of rheumatic cases limited to those exhibiting cardiac symptoms; for though endocarditis is of more frequent occurrence—compared with the number of cases—in children than the same sequela is observed in the adult (in whom from ten to twenty per cent. contract a permanent organic lesion of the heart), still there must be, and are, many cases of acute rheumatism which run their full course without terminating in heart-disease. In order to ascertain this, the heart must be watched in every doubtful case. Endocarditis is sometimes the first symptom of acute rheumatism in children, and precedes every other even in apparently mild cases, and pericarditis and myocardial changes are not rare. When the slightest symptom of chorea minor shows itself, the heart must also be examined together with the joints, for there are those cases in which chorea is not the final development of rheumatism and rheumatic endocarditis, but the very beginning of the disease, and then referable to a rheumatic affection of the spinal membranes.

All of these remarks I believe to be opportune, because of the frequency of cases in which the persistent notion that rheumatism is a rare disease gives rise to an erroneous diagnosis—the ubiquitous “dentition,” “worms,” “malaria,” and “colds”—and false treatment. After all, a correct diagnosis is the foundation and *sine quâ non* of sound therapeutics; thus I shall, in this neglected instance, add a few words on the subject of diagnosis, which is sometimes quite difficult.

Fever is a common symptom in small children; every physical disturbance raises their temperature. In acute rheumatism it is often but slightly elevated; it sometimes rises at irregular times, being now and then highest about noon. The swelling

of the joints is apt to be very trifling and is often overlooked, the pain (either spontaneous or on pressure) may be very much less than that resulting from fatigue, rhachitis, syphilitic bone disease, colic, or otitis. Thus in every doubtful case of discomfort or pain the joints and heart must be examined for rheumatism. The diagnosis of acute articular rheumatism becomes quite difficult when but a single joint is affected, either temporarily or through the whole course of the attack. Such a monarthrititis is principally observed in the hip- or knee-joint, both of which are also the occasional seats of traumatic injuries or tubercular degeneration. Sometimes, after a week only or still later, the additional inflammation of other joints facilitates the recognition of the exact condition. The isolated inflammatory rheumatism fails also often to be recognized because of its being denominated "growing pain." The latter term dates from the medical nomenclature of past centuries, and ought to have been dropped long ago. What has been called by that name is of various origin and nature. It may be a neurosis of a joint with or without an cedematous swelling. I have seen a number of such instances in children of both sexes, about the shoulder-, hip-, and knee-joint mostly. Another affection which has been classed under the head of "growing pain" is epiphysitis and the congestive swelling of the intermediate cartilage of the long bones. It is a frequent occurrence, without a perceptible cause beside the physiological hyperæmia required for normal growth, and liable to become pathological; it is often noticed in the convalescence, or recovery, from infectious diseases, particularly scarlatina. Still, the large majority of attacks of "growing pain" means rheumatism; it is the failure to appreciate this fact that gives rise constantly to mistakes in diagnosis, and the neglect in the administration of both preventive and curative measures.

The treatment of *acute articular rheumatism* has been quite unsatisfactory down to a modern time. A few of the indications are furnished by the actual or alleged causes of the disease. By some it has been believed to be endemic, like cerebro-spinal meningitis; it is sure that certain localities have been known to harbor a great many cases at the same time. Thus, a change of residence, if practicable, ought to be re-

sorted to, provided the individual case is but one of a great many in the same neighborhood. Contagion has now and then been presumed to cause the spreading of the malady; but the number of observations of the kind is but very limited indeed. Rheumatism is very apt to make its appearance during and after some of the most prevalent infectious diseases, such as diphtheria, scarlatina, typhoid fever, dysentery, and erysipelas. Therefore the greatest possible care bestowed on those sick with them will prove a powerful preventive of rheumatic fever. The blood has been found to be changed during the latter affection. According to many writers, both chemists and physicians, the alkaline condition of the blood is less pronounced. This change, or the actual prevalence of acid in the blood, has also been either proved, or assumed to exist, in cachectic conditions of many kinds, in fevers, uræmia, leucocythæmia, diseases of the liver, in poisoning with acids, lead and mercury, in pyæmia, typhoid fever, gout, and diabetes. In them, as in acute rheumatism also, lactic acid has been found in an undue proportion. It is the same acid which has been found in over-exerted muscles; still, when introduced into the circulation, it never produced articular rheumatism. The diminution of the alkali of the blood would justify at once the administration, through the whole course of an acute rheumatism, of alkaline salts, and particularly potassium; the latter is greatly diminished according to Beneke, who, besides its relative absence, looks upon the impairment of nerve-power and the accumulation of organic acids as the main factors in the pathogenesis of rheumatism.

Sudden changes of temperature are certainly among the causes of acute rheumatism. Cold and moist weather, moist houses, exposure to wind and rain will bring it on. This effect may be immediate, and consists in the sudden suppression of the cutaneous circulation, or gives rise, by reflex action, to vaso-motor or trophic disturbances in the joints. Particularly is that so in those who have inherited a disposition. Such an inheritance is not at all infrequent. I have seen acute rheumatism in several children of a rheumatic father or mother. The treatment of such cases must be mainly preventive. The tendency to be influenced by sudden changes of

the surrounding temperature can be modified or removed by the systematic use of cold water. Children with disposition to rheumatism must have a daily cold wash, sponge, or bath. The former is the mildest mode of application. They may be rubbed down with a wet sheet, and afterwards with a warmed dry and coarse bathing towel. Those who have been strengthened by this procedure, or such as are stronger, may be sponged, or use a shower-bath for a few seconds, or a cold bath. These will be well tolerated and prove useful, when the surface, mainly of the extremities, becomes warm after a moderate dry friction. Such children as feel chilly after these applications, may begin their treatment with tepid water and alcohol (4-6 : 1). I ought to add here, that this treatment will accomplish its end best when throughout the rest of the day great care is used to protect the surface. A cold wash or bath, given to harden and strengthen, must be combined with warm clothing and bedding to protect. Nothing could be more injurious than the exposure of the surface to wind and rain. The bare knees and calves of the children of vain mothers are foolhardy provocations of the invasion of many of the serious diseases.

The swollen and painful joints must be protected against the pressure of blankets or painful handling by raising the bedclothes, keeping the limbs in a basket of proper size (waste-paper basket), and covering them thickly with cotton. Well-covered splints add greatly to the comfort of the patient. When pain and swelling are unusually severe, the application of an ice-bladder or ice-cloth is advisable. Very young or anæmic children do not bear them long. Cold water will then take the place of ice-water or ice. A wet bandage, or pack, round the afflicted joint is often borne well and relished. It ought to be changed every hour or half hour. Very anæmic and neurotic patients prefer hot and dry applications, mainly in those cases in which the pain is the principal symptom complained of. To relieve the latter I cannot advise the subcutaneous injections of carbolic acid which have been recommended; in very severe cases I have been compelled to administer a few drops of a solution of morphia hypodermically. As a rule, however, oleate of morphia or a mild solution (from

two to four per cent.) of muriate of cocaine on the skin, a chloroform liniment brushed on, chloroform poured into the cotton surrounding the joint and retained by oil silk, or a very mild galvanic current will give some relief.

The swelling of the synovial membranes and ligaments in retarded convalescence or chronic cases taxes the patience of both the sick and the physician. Vesicatories kept on for half an hour, and frequently repeated; the wet bandage or pack snugly applied so as to compress gently; compression by bandages, or collodion, gentle massage; the galvanic current daily applied, find their indications in many and various cases. Iodine will come in for its share of usefulness. Beside the internal administration of the iodides (potassium or sodium, or both combined, in doses of grs. v to xx daily), the external applications will be found beneficial. The officinal ointment will act through the gentle handling and kneading necessitated by its use. Solutions of the iodide of potassium in glycerin will act better, but are inferior to the lanolin ointment referred to in a former article. Superior to all, however, is the application, twice daily, of one part of iodoform in from eight to fifteen of collodion or flexible collodion. It is brushed over the swollen part copiously, and allowed to dry while the limb is kept absolutely at rest for ten minutes. Only such scales as get detached spontaneously may be removed; otherwise the next application is made on top of the preceding ones. Very old cases, with chronic effusion into the joint, require aspiration and washing out. These manipulations have become safe in the hands of every physician who knows the use of soap and disinfectants on himself and his instruments since operative surgery has availed itself of the immense progress made in pharmacological laboratories.

Endocarditis demands absolute rest, both of the organ and the body. Every exertion will prove injurious. Thus an occasional dose of opium or bromide, or both combined, has a good effect. The application of an ice-bag to the cardiac region, or, when that proves too heavy, an iced cloth, acts very favorably indeed. But not every murmur means endocarditis; it may be the result of muscular incompetency or irregular contraction only, and quite temporary; it is sometimes observed

in cases of but moderate severity, and mainly combined, or alternating with, or preceding chorea minor, which now and then makes its appearance in the very earliest period of acute rheumatism. Both chorea and endocarditis can be mitigated or prevented by early attention. If every case of incipient rheumatism were sent to bed, if no "growing pain" were allowed to be on the play-ground, or at school, many a life-long ailment and early death would be avoided.

The temperature is but rarely high, or rather there are a great many cases of articular rheumatism in infants and children in which the temperature is as little elevated as the rest of the symptoms urgent. But there are such as yield temperatures of from 104° to 107° and more. It is in these that delirium and other cerebral symptoms, paralytic respiration and collapse may make their appearance, and that the most efficient antipyretics must be employed. Among them the cold pack, as described in former papers, and applied to the trunk and lower extremities as far down as the knees, is the readiest and most effective. It is particularly indicated in the cases complicated with endocarditis; it is in these that antipyrin, acetanilid ("antifebrin"), and phenacetin will not always have a pleasant effect. All of them are inferior to the salicylate of sodium in regard to antirheumatic and antipyretic action. A child of three years may take from six to ten grains every two or three hours, for one or more days. This is the less dangerous the more the symptoms of overdoses are understood. When they appear (mainly the brain symptoms, tinnitus, stupor, paralytic or interrupted, sighing, respiration) ample time is given for the discontinuation of the drug; a single large dose for the night, of from ten to twenty-five grains, succeeds better, sometimes, than the many smaller ones. As a rule, salicylate of sodium mitigates the symptoms of pain, swelling, and fever very soon. Many of the patients feel very much better after the lapse of a day; then the doses may be diminished or administered at longer intervals. Longer than from three to five days it ought not to be given; if no effect, or an insufficient one only, be obtained after that time, no further reliance need be bestowed on it. Then antipyrin, antifebrin, or phenacetin may accomplish what the salicylate

failed in. In the same way salol, salicin, and cresotic and benzoic acids have been recommended.

At the same time, particularly when there is a constant tendency on the part of the temperature to rise either permanently or periodically, sulphate (or another preparation) of quinia may be administered in one or two doses of from five to eight grains each. The most opportune time is the period of remission which mostly takes place in the morning. Alkaline salts may be given alongside the other medication, alkaline mineral waters, such as Seltzer or Vichy or bicarbonate of sodium, from a scruple to a drachm daily, or citrate of potassium, or the bitartrate; or one of the nitrates which have formerly been credited with almost a specific action. Vegetable acids have been warmly recommended, such as citric acid. They take the place of alkaline salts, inasmuch as they are eliminated as carbonic acid. The iodides of potassium and sodium have been esteemed very highly,—justly so, indeed,—particularly as the tendency to chronicity renders desirable the persistent effect of a powerful absorbent. Of the other remedies, which have been given for their alleged specific effect (colchicum, colchicin, veratrum, aconite), I have seen but little effect in acute rheumatism of infancy and childhood. They, too, render better service in the cases which have become or are fast becoming chronic.

Gonorrhœal articular rheumatism is not excessively rare among infants and children, though direct sexual intercourse be not frequent at that age. It is mostly confined to one or a few joints (knee, ankle, shoulders), and of subacute nature; the effusion is liable to be excessive, and apt to be purulent. The latter condition being dangerous partly to the joint, and partly through its tendency to infect the body, must be watched carefully; for it is often the beginning, or part, of a general pyæmia; in a few instances I have seen the eye destroyed by panophthalmitis in twenty-four hours, and the child died, after weeks of suffering, of the general infection. The cause is often what may be taken for a common vaginal catarrh, but frequently is gonorrhœa. The long time the latter may be concealed, unchanged in its contagiousness, within the vagina of the adult, and the facility of communicating it to the young by direct

contact or mediate communication through towels, bed-cloths, etc., yield a clue to certain otherwise unexplainable cases. The treatment of the diseased vagina has its own indications. That of the joint affected with gonorrhœal rheumatism must be more local than the average case. An aseptic puncture may be made for the purpose of ascertaining the contents of the synovial cavity. If there be pus, it must be removed and the cavity washed out, thoroughly disinfected, the limb rested on a splint and gently compressed. If serum in large quantity, puncture may become necessary when other treatment becomes unavailing. Otherwise gentle but steady compression by bandages, with or without mercurial plaster underneath, or by iodoform collodion, are indicated; at the same time the use of salicylate of sodium and iodide of potassium and (or) sodium must be continued a long time.

During and after an attack of acute articular rheumatism there will be noticed, occasionally, small neoplasms on tendons and the insertions of muscles, fasciæ, and periosteum, varying in size, numbers, and sensitiveness, which consist of young connective tissue with numerous cells, last from a few days to several months, and give rise to but little elevation of temperature. Sometimes they are the very last, or only remaining, symptoms of the disease; now and then a new endocarditis has been observed to make its appearance with them. This "*nodulated rheumatism*," "*rheumatismus nodosus*," is more frequent in children than in adults; the oldest patient in whom I have seen it was a boy of eighteen years. In his case the insertion of the occipital muscle was the principal seat of the nodules, dozens of which, from the size of a pea to a small hazel-nut, could early be distinguished. From syphilitic gummata, fibromata, gout, and cutaneous tubercles they can be distinguished easily. Special therapeutics for this form there is none.

Peliosis rheumatica is the name of a peculiar form of more or less localized purpura. In some cases of rheumatism a large number of small subcutaneous and cutaneous hemorrhages appear mostly on the lower extremities, and mainly round the joints. Now and then they are painful, but frequently not sensitive at all. In this they do not differ from common purpura. In a number of cases of peliosis the heart

was not found affected; and the inference has often been drawn that peliosis is no rheumatism at all. Indeed, purpuric hemorrhages are often noticed in other infectious diseases (typhoid, measles, whooping-cough, pneumonia, Bright's disease, syphilis, mercurialism), and not infrequently round the malleoli and joints in general (maybe in consequence of the impediment to circulation resulting from the smaller amount of subcutaneous fat and consequent tension of the integument in those regions), and in a number of instances the accompanying articular pains of such constitutional diseases are best explained by the presence of hemorrhages inside. Still, peliosis will sometimes appear quite early in acute rheumatism, and these are the cases which have been the reason why they were classified as a specific variety, and peliosis claimed to be a specific rheumatic affection. If so, it requires no special treatment; but the structural condition of the walls of the blood-vessels (and insufficient innervation and the presence of specific bacilli?), which causes the hemorrhages, indicates the early administration of roborants, cardiac stimulants through the whole course of the disease, and great caution in the doses and quantities of salicylate of sodium, which has rather a disposition to increase the hemorrhagic tendency.

There are a great many varieties, or rather degrees, of peliosis, similarly to what we know to take place in purpura. According to whether the hemorrhage takes place near the surface or in the deeper layers of the tissue, both the color and the massiveness of the hemorrhage will differ. In some cases the result is an *erythema*, which has been called either *papulosum* or *nodosum* from the differences in the results of inspection and palpation. It is observed both in severe and mild cases of articular rheumatism; it is somewhat raised above the level of the skin, sometimes deeply inserted and then circumscribed; and frequently found near the joints. In accordance with the indications furnished by rheumatismus nodosus and peliosis no special therapeutics is required for this form.

Chronic articular rheumatism is but rare in childhood. Moncorvo reports the case of a girl of two and a half years, whose rheumatism began with an acute attack, became chronic, and was finally cured by the galvanic current administered for a long time in succession. The youngest case of mine, also a

girl, was five years old. She was puny and feeble, and her general nutrition defective. A number of the large and small joints, particularly of the hands, were affected, and the tumefactions of the ends of the bones quite marked. There was neither an affection of the voluntary muscles nor the heart, and no disease of any part of the nervous system which Mitchell (1831) and Charcot (1868) have found to be the cause of "arthropathic" swellings. The treatment is about the same resorted to in the same disease when met in the adult. Salicylate of sodium must be given in those cases only which exhibit acute exacerbations. Colchicum, aconite, iodides will take its place, and will be required for a long period. Small doses of arsenious acid, from one-three-hundredth to one-five-hundredth of a grain every two or three hours, will answer well. Warm baths, salt-water baths (cold or warm), and sulphur baths will improve many a case. So will "hydropathic" treatment, galvanism, and massage. Others will be benefited by dry heat, sand-baths. For external treatment a diluted tincture of iodine, iodoform ointment, iodoform collodion, or the iodide of potassium and lanolin ointment can render good service. Narcotics are seldom required. The best results are obtained by the protracted use of alkaline waters. From what little I have seen of chronic rheumatism in children, and the many cases of the same disease in the adult, I recommend strongly the use of a lithia water (from one-half to a pint of the Buffalo lithia water), to which is added from a scruple to half a drachm of the bicarbonate of potassium as a daily dose.

Muscular rheumatism can be diagnosticated occasionally in very young children; in those from six to twelve years it is not so very rare. Its nature and symptoms do not differ from those in the adult. The neck, back, and shoulders are most frequently affected. The best preventive is the habitual use of cold water. Diaphoretics are not very useful. Narcotic and stimulating liniments find their own indications. Oleate of morphia is of but little use; in a severe case I have injected a small dose of morphia with immediate and permanent effect. The interrupted current acts promptly in one or more sessions. The salicylate, antipyrin, antifebrin, and phenacetin have a speedy effect, in proper doses frequently repeated. Semmola's

experience in a severe case of neuro-muscular rheumatism is worth remembering. The case was that of a woman of forty years, who suffered from stiffness and pain in a shoulder and right arm, with good passive motility of the joint. After the pain had lasted several months, massage, electricity, quinia, and salicylic acid having proved inefficient, the patient was relieved in a few days by a few subcutaneous doses of one-twelfth of a grain of pilocarpin.

In but rare cases the rheumatic process in the muscle assumes the character of an inflammatory affection. Then there is a hyperplasia of the connective tissue between the fibrillæ, the muscle becomes hard and somewhat shorter, its electrical irritability grows less or disappears, the skin even participates in the process. Such a case I once observed in a boy of twelve years. He was never entirely relieved, but greatly improved by massage, warm bathing, a mild continuous current, and the internal administration of hydrargyrum bichloride. The treatment was continued for more than a year.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from May Number.)

VI.—STOMATITIS CROUPOSA—STOMATITIS DIPHTHERITICA.

It is not the province of these articles to enter into the discussion concerning the identity of croup and diphtheria. The opinion which is held by any individual upon this question depends upon a variety of circumstances, not the least important of which seems to be the kinds of cases which have come under his observation. Some clinicians (and their number is not small) have not been satisfied with the decisions that have been handed down by those who were formerly looked upon as authoritative,—the pathologists,—and with more or less

powerful arguments, always clinical in their nature, have reasoned themselves into the view of the identity of the croupous and diphtheritic process. Others, on the other hand (and again their number is not small), who have seen what they considered as pure and uncomplicated croup cases, for which they, in their turn, have advanced clinical arguments, have insisted upon a separation of the two processes as non-identical. As we no longer look upon the pathological anatomist as the supreme judge to whom the last appeal is made, and as we certainly have no right to decide questions of etiology by purely clinical observation, the whole discussion has resolved itself into a matter of scientific belief, which, although a contradiction in terms, is of wide-spread existence. From this stand-point it may not be improper to state that the author believes that the diphtheritic and croupous processes, while frequently combined, are in their nature two essentially different entities, caused by different agents and followed by different results in the human being.

At the present day the court of appeal is made up of bacteriologists with chemists (the latter in the minority), who have not, as yet, passed their verdict upon the mooted points. It is by no means positive that when this will occur it will be final for all time, but for us the question will be settled when this is satisfactorily done, if such is possible, by these jurors.

Stomatitis crouposa is always a complication of angina crouposa. As far as the literature and my own experience goes, I know of no case of primary croupous inflammation of the mouth. In a great number of cases of angina crouposa the membrane develops simultaneously upon the tonsils and adjacent parts of the mouth. In severe cases extension takes place to the tongue, the lips, and the cheeks (Steiner). One of the characteristics of this process is the comparatively slight involvement of the lymphatic glands. We find this in stomatitis crouposa as well as in croup in other locations. As the disease is part of another disease of very much greater importance, and as it does very little, if any, damage by itself, its prognosis can be of importance only in that it indicates by its presence the intensity of the condition which affects the patient.

There is little, if any, treatment required for the stomatitis beyond the one used for the angina. When the membrane has been shed, it will sometimes be found necessary to apply some of the remedies which have already been recommended in those cases in which there exist superficial ulcers of the mucous membrane of the mouth, although these are exceptional.

STOMATITIS DIPHThERITICA.

In birds and in the calf stomatitis diphtheritica is the most common form of deposit of diphtheritic membrane. In the human being primary diphtheria of the mouth is extremely rare; yet cases do occur, and one especially is of great interest (found in Gustin, "*Étude Clinique sur l'Inoculabilité de la Diphthérie*," Paris, 1883, and Sanné, "*Dictionnaire Encyclopédique*," iii. p. 29). The case was originally reported in the *Union Médicale*, 1859, by Professor G. Sée. A wet-nurse was nursing her own child, ten months old, and a little girl which had diphtheria of the vulva and of the lips. Several days after the latter was taken sick the nurse's own child began to complain of the same series of symptoms,—*i.e.*, diphtheria of the lips,—which was followed by angina diphtheritica and croup, the latter fatal. The mother, who persisted in kissing her child, was also taken with diphtheria of the lips, but the disease remained localized to this place. Another child was also affected with diphtheria, but there was produced, from the start, an angina diphtheritica. The nipples and breasts of the mother remained normal throughout the whole course of the disease. The case is of interest not only because of the number of interesting cases connected with it, but also on account of the fact that we have three cases of primary diphtheria of the mouth. Although cases of this sort are extremely rare, yet they must be more frequent than would be inferred from the very few cases upon record. The statements made by the best authors—Jacobi, Seitz, Baginsky, and others—lead us to the conclusion that they have seen cases of primary diphtheria of the mouth, although, as Jacobi says, "diphtheria of the mouth (primary) is not very common, but is not infrequent with diphtheria of the pharynx or nose." Sanné says that in epidemics it is not rare

that the mouth is affected primarily. When infection has taken place by the mouth the lips are usually the first to become affected. From here the membrane may extend to any part of the mouth or to the tonsils.

In diphtheria of the tonsils, when the membrane extends to the mouth, we usually see the following method of invasion: first, the pillars of the fauces, perhaps more commonly simultaneous with the angina; then the tongue, cheeks, lips, and gums. This, however, is subject to a great many exceptions, for example, the case reported by Seitz ("Diphtherie u. Croup," 1877, p. 312). The membrane was first noticed upon the left tonsil; then upon the gum at the last right incisor tooth; then upon the right side upon the dorsum of the tongue, at the same time diphtheria of the nose. Those cases are apt to be accompanied by diphtheria of the mouth in which the general infection is very great, in so-called septic cases. It is pretty well established that diphtheria cannot be inoculated upon a healthy mucous membrane (Rajewsky, Loeffler, and others), and therefore it is necessary to conceive of some alteration of the mucous membrane of the mouth before it can become diphtheritic. This is not difficult in diphtheria, and the clinical evidence will confirm all that is necessary to make a mouth diphtheritic. In all cases of diphtheria more or less profound changes go on in the mucous membrane of the mouth,—from a simple injection or dryness to a stomatitis of one kind or another. It is a matter of astonishment that stomatitis diphtheritica does not occur more frequently than is the case, when we take into consideration that the membrane which is expectorated almost always comes into contact with a mucous membrane ready to have the seed for further growth implanted upon it. The frequency of invasion of the mouth can be approximately stated by referring to a table published by Minnich ("Croup u. seine Stellung zur Diphtheritis," Wien, 1888), in which three cases of thirty-seven of diphtheria had stomatitis diphtheritica. When, however, the mucous membrane of the mouth becomes diphtheritic we always find accompanying the process a stomatitis catarrhalis, which is independent of any condition there may have been present before the diphtheria had developed.

Salivation is an almost constant symptom, accompanied by

a fetid odor from the mouth, the same which is noticed in angina diphtheritica, in well-developed cases. Before the eruption of the membrane the place upon which it develops becomes very much injected, almost livid, and in a comparatively short time (from twelve to twenty-four hours) we see upon or within this injected area the characteristic membrane. This membrane, depending somewhat upon the intensity of the process, may appear as discrete spots which afterwards confluence, or the whole livid area may immediately be covered in its full extent by one membrane. At the same time there is marked swelling of the lymphatic glands under the jaw, accompanied by more or less tenderness upon pressure. In septic cases, frequently the general condition of the patient is such that subjective signs are of no especial value, or they do not exist. The membrane remains for a variable time,—three to five or six days,—and then either drops off or ulcerates away. In either instance there is left a denuded spot, where the epithelium is absent, and, depending upon the amount of ulceration, more or less loss of substance. As a rule, cicatrices do not occur, but sometimes the loss of substance becomes great and then connective tissue is formed; especially is this the case upon the tongue. During the whole process there is a continuous flow of saliva, which may erode the skin with which it comes into contact. At the corners of the mouth it is not uncommon to find a diphtheritic patch, and sometimes the diphtheritic process will extend to the skin upon either the upper or lower lip.

Hemorrhages occur with this form of stomatitis, sometimes severe, at other times the loss of blood is not very great; they are always of bad prognostic omen, for they mean general infection of great intensity. The oozing out of a few drops of blood from the mucous membrane in a diphtheritic patient, especially when due to mechanical irritation, of course means nothing; but there are cases upon record in which the patient has lost his life directly by hemorrhage from the mouth, and a great many more in which a slight hemorrhage seemed to be sufficient to destroy the last spark of vitality left to the debilitated subject. (See Sanné, *loc. cit.*)

The prognosis is best expressed with Jacobi (*loc. cit.*), that

"under all circumstances stomatitis diphtheritica is of a dangerous nature." In primary cases the prognosis seems better than in those in which the membrane has extended from other parts. Such cases are so very rare, however, that they need hardly to be taken into consideration when generalizing upon the subject. It seems necessary to state that the localization of the membrane has very little, if any, effect upon the production of sequelæ or upon the possible development of complications.

The treatment is the same as that for any other form of diphtheria; but Baginsky's statement that this process "challenges local therapy" is one that ought to be borne in mind. Every physician who has dealt largely with diphtheria has selected for himself the local remedy upon which he places the most reliance. These are the cases in which he can test this remedy and see how valuable it is. There is no difficulty in removing the membrane, accessible as it is to all local medication, and for this purpose a great number of remedies can be used: carbolic acid, corrosive sublimate, nitrate of silver, the persalts of iron, permanganate of potassium, trypsin, papayotin, etc. The great question, after all, is whether the removal of the membrane will do the patient any good. When we are dealing with a case in which the constitutional effect is not very great, or even moderately severe, I have no hesitation in saying that the indication exists for the removal of the membrane. When, on the other hand, severe constitutional symptoms exist, the local treatment of diphtheria is futile and, sometimes, harmful. In such cases time cannot be wasted nor the strength of the patient be dissipated by attempts at destruction of the membrane. Unfortunately, whatever is done is for naught, in the great majority of such patients; but, at all events, attempts should be made to treat the general condition which is the one producing the most serious and, most frequently, the only issue,—death.

VII.—STOMATITIS SYPHILITICA.

It is almost unnecessary to state that, strictly speaking, there is no such process as stomatitis syphilitica. Syphilis, *per se*, does not produce stomatitis except in an indirect way, in that

it may either cause the mucous membrane of the mouth to become more sensitive to stomatitis producers, or in that it causes a lesion of some sort which, in its turn, provokes inflammation. The term has been retained in our classification for the sake of convenience and because it is found extensively employed in the literature of stomatitis.

Syphilis manifests itself in and about the mouth in well-defined forms and in well-recognized localities. The localities that are especially apt to be affected are the lips, the tongue, and the mucous membrane covering the cheeks. The teeth, it is claimed, are subject to the general law of the characteristic nature of the syphilitic lesion, but this is still open to discussion. It is quite difficult to lay down an absolute law which will hold good in every case, so that we may be guided by it for diagnostic purposes. If we hold fast to specificity of lesions produced by syphilis there are cases in which it becomes absolutely impossible to make a diagnosis of syphilis simply by an examination of the patient. Again, if we rely upon the statements made by parents, we are in danger of erring in two directions,—either in considering a manifestation as syphilitic when it is not, or, more commonly, of overlooking a specific manifestation entirely. Fortunately, these combinations can only arise exceptionally, for, as a rule, the patient may be observed for some time, and we have collateral evidence which guides us much more safely than the admission or denial of the parents. If we except the teeth, the lesions in the mouth are nearly all characteristic, and no doubt can arise as to the general diagnosis in their presence.

Syphilis manifests itself upon the lips in one or other of the following forms: syphilitic fissures, papules, plaques, and erosions. The fissures (rhagades) represent the most common specific manifestation upon the lips. When they are present they are absolutely characteristic and leave no doubt as to the diagnosis. They are characterized by their location, their appearance, and their duration. The most common place of appearance is the corner of the mouth, then the upper lip and, comparatively rarely, the lower lip. Upon the upper lip we usually find them upon either side of the median line, and they differ somewhat from those found at the corner of the

mouth. In the latter place, as a rule, the most striking thing about the fissure is that we are dealing with infiltration which has been split in or about its middle. The fissure sometimes loses itself in the mucous membrane, sometimes stops before reaching it, sometimes runs into the mucous membrane, as in the case of the fissures upon the lips. The infiltration (small-celled) is somewhat elevated, the fissure may or not be covered by a crust, and, contrary to most syphilitic eruptions, produces more or less pain when the mouth is opened. On account of the cracks being connected with the mucous membrane, small hemorrhages may occur, and the crust may therefore be made up of coagulated blood which has extraneous matter mixed with it. These rhagades do not secrete very much unless they are made up of papules, when their surfaces as well as the fissures are apt to be moist. This form is rarely found upon the upper lip, where the fissures are characterized by the lack of infiltration, but the fissure usually ends in an infiltration upon the mucous membrane. If we turn up a lip upon which there is such a fissure the rhagade will be found to end in some form of syphilitic lesion upon the inner surface. This class of fissures is sometimes present in great numbers, disfiguring the mouth and causing great annoyance to the patient. All rhagades are characterized by their persistency and by their lack of tendency to spontaneous healing. Those found upon the lip, although they do not secrete more than the form at the commissure, are even more persistent. They may cause disfigurement of the lip because of the inflammation which is caused by them, which, when they heal, always produces cicatrices. Again, the fissures may be so deep and so numerous that by their presence alone the whole shape of the mouth is changed.

Papules are most commonly found at the commissure, although the free border of the lip is sometimes infiltrated and thickened by a broad papular eruption. As stated above, they may have a fissure upon them, but usually they are found in the form of a condyloma latum. Their surface is elevated and moist; their tendency is to break down in the centre, producing an ulcer which is covered by a crust. When this crust is removed there is found the ulcerated surface, which does not

bleed very much. The papules, in and of themselves, produce very little pain unless they involve the mucous membrane.

Plaques muqueuses and erosions are found upon the mucous membrane. They are both superficial, but cover more space than any of the forms described before. The infiltration is not so well marked, but nevertheless there is more or less thickening present.

(To be continued.)

TETANY.

BY J. LEWIS SMITH, M.D.,

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THE disease known as tetany has probably always existed, for its recognized causes are of common occurrence, but the attention of the profession was first directed to it by a memoir bearing the title "Observations sur une Espèce de tétanos intermittent," published by M. Dance in the *Archives Générales de Médecine* in 1831. He described it as it occurs in the adult. In the following year, 1832, M. Tonnelé published in the *Gazette Médicale* an essay on tetany, which he designated a new convulsive disease of childhood. In the same year, Constant and Murdoch also published their observations on this malady in French medical journals, the former designating it "contractures essentielles," and the latter "retractions musculaires et spasmodiques." In 1835 the memoir of De la Berge on tetany, bearing the title "retractions musculaires de courte durée," was published in the *Journal Hebdomadaire*. From this time the disease was fully recognized in France, and several additional monographs relating to it appeared in medical journals prior to 1850, among the most notable of which was the thesis of Delpech in 1846. The term tetany (tétanie) was first employed by Dr. Lucien Corvisart in an interesting and instructive paper published in 1851.

The term tetany is applied to a disease which is characterized by tonic contraction of muscles, commonly those of the

extremities, but sometimes also those of the face or trunk, produced by causes external to the nervous system, and usually of temporary duration. The exception to this definition might be as regards such causes as are psychical or emotional, if such exist. Following this definition we would exclude cases of tonic muscular contraction, however close the resemblance, which arise from disease of the brain, spinal cord, or their meninges, or from disease of the nerve supplying the affected muscle. The contractions in these cases are not the malady itself, as in tetany, but are merely symptoms of some important disease located in the nervous system at a distance from the affected muscles.

Causes.—Tetany may occur at any age, but is most frequent in infancy, in early childhood, and in early adult life. Of twenty-eight cases observed by Rilliet and Barthez, one was at the age of nine months, thirteen between the ages of one and two years, five at the age of three years, and the remaining nine between the ages of three and fifteen years. Eustace Smith says that the period during which the largest number of cases occur is between the first and third years. In one hundred and forty-two cases collated by Gowers, the ages were as follows: Between one and four years, 34; between four and nine years, 8; between nine and nineteen years, 36; between nineteen and twenty-nine years, 24; between twenty-nine and thirty-nine years, 23; between thirty-nine and forty-nine years, 13; and between forty-nine and sixty-one years, 4. Erb remarks that a strong tendency to tetany is exhibited in early childhood, and the next most common period of its occurrence is at the age of puberty and early youth. The statistics of different observers show that tetany is more common in males than females. Of Rilliet's and Barthez's twenty-eight cases, twenty were boys. Of the one hundred and forty-two cases embraced in the statistics of Gowers, seventy-six were males and sixty-six females. According to Gowers, in the first and second decades, in which a large majority of the cases occur, more males are affected than females, but between the ages of twenty and fifty years, females preponderate, while above the age of fifty years all the recorded cases have been males. It is seldom that the most thorough investigation

elicits any inherited predisposition to nervous or other diseases in cases of tetany. Most of the observed cases have occurred singly in families, and in families which exhibit no special tendency to nervous or other ailments. Rarely, however, multiple cases have occurred in families, from which we infer that there may be an inherited neuropathic tendency. The only instances of this sort which I have been able to find in the literature of tetany were two cases observed by Murdoch in one family, and cases alluded to by Abercrombie, who states that at different times four cases occurred in each of two families, and two cases in another family.

Although in many instances different causes appear to act simultaneously in causing tetany, nearly all writers, who have contributed to the literature of this malady, assign the most important place in the causation to diseases of the digestive apparatus. Trousseau states that in the cases which have fallen under his observation, diarrhoea has been commonly present. He says that in 1854 he met many cases following cholera, but in one instance occurring in his practice the cause seemed to be obstinate constipation. The patient, at the age of seventeen years, was suddenly seized when travelling. His fingers were bent and he could not extend or use them. The tetany subsided in two or three hours, but it recurred every day for three months. He was treated by bleedings, but the tetany was uniformly worse after each loss of blood, the contractions becoming more severe and also more general. Not only were the muscles of the extremities in a state of tetanic contraction, but also those of the face and trunk, so that respiration and speech were embarrassed. Although the contractions were aggravated by bleeding, and were never so bad as after the fourth venesection, they ceased entirely for a period of ten months after cupping along the spine. Subsequently they recurred every year at the close of winter and continued two months. The patient was habitually constipated, and the torpid state of the bowels seemed to be the chief factor in producing the tetany. In the following case which I have recently had under observation, constipation appears also to have been the chief cause: George C., without teeth, and at the age of seven months, when tetany commenced,



PHOTOGRAPH OF A CHILD, SHOWING TONIC CONTRACTION OF GROUPS OF
MUSCLES OF THE EXTREMITIES AS THE RESULT OF TETANY.

was taken from the breast at the age of two months. He lives in a tenement house, and from the time of weaning has been fed with condensed milk, one heaped teaspoonful of large size to fifty of water. Besides this, he has taken once daily a tablespoonful of Nestlé's food to ten of water. With this diet his growth has been about like the average, but he has been habitually very constipated, so as frequently to require assistance in obtaining an evacuation. Recently groups of muscles in all the extremities have undergone tonic contraction, producing deformities as shown in the accompanying photograph, and brief attacks of laryngismus stridulus. These attacks of spasm of the glottis occur both by day and by night, causing for a moment the characteristic stridulous respiration. The mother states that at times he is feverish, probably from the constipation, but usually he seems entirely well, except as regards the sluggish state of the bowels, and the contractions. Attempts to straighten the fingers and toes elicit cries from the pain. The mother also says that at times both thighs and both legs are flexed, and he resists attempts to straighten them on account of the pain. The treatment employed consisted in the use of bromide of potassium and measures designed to relieve the constipation. When these remedies were perseveringly employed, the contractions gradually diminished, and ceased; but they returned when the treatment was discontinued. Four months have elapsed since the commencement of the disease, and it is only in the last week or two that the contractions have entirely ceased. The important factor in producing the tetany in this case appears to have been the habitual constipation. One tooth pierced the gum during the four months of tetany.

Erb says that all forms of intestinal disease may cause tetany, but it especially occurs after "protracted and exhausting diarrhoea." Gowers also remarks that the most common cause of tetany is diarrhoea, "usually long-continued and exhausting, but sometimes acute and brief." Among the rarer intestinal causes of tetany may be mentioned the presence of worms. I have not found in the literature of tetany any instance in which lumbrici or ascarides caused the contractions, but Gowers alludes to three cases in which they were produced by the tape-worm.

From the nature of tetany and from the important part long assigned to dentition in producing nervous ailments, it is perhaps remarkable that the teething process has so seldom been regarded as a factor in causing tetany in young children. But so far as I have been able to learn from memoirs and recorded cases, those who have made special study of tetany agree for the most part with Trousseau, who says that in nearly all instances pathological conditions distinct from dentition are present "on which tetany would seem rather to depend." Nevertheless, in the following case which was treated by Professor E. G. Janeway and myself, after repeated and thorough examinations, teething was regarded by both of us as the chief cause of the contractions.

Notes of case.—B., aged twenty months, well-nourished, has during the last few days been unable to use the left lower extremity. The thigh is flexed at an angle of about forty-five degrees and the leg at about the same angle, and attempts to overcome the rigidity of the flexors and straighten the limb are resisted and are painful. The muscles in the other extremities, and those which move the foot and toes of the affected limb, appear to have their normal functional activity, as do those of the face, neck, and trunk. The gums were swollen and congested over the crowns of five advancing teeth, which appeared to be in nearly the same stage of development, and were evidently soon to protrude. It is possible that a rather sluggish state of the bowels may have been a factor in causing the tetany, but the chief agent was apparently the cutting of so many teeth. There was not at any time any notable elevation of temperature, loss of appetite, or derangement of the functions of important organs, but the contractions continued three weeks, when all or nearly all the imprisoned teeth escaped, and the limb was quickly restored to its normal state. There has been after the lapse of two years no return of the tetany.

Tetany is more liable to occur in those whose systems are enervated by pre-existing disease than in those who are robust. Rilliet and Barthez state that in cases which have come under their observation the patients were often in poor health, resulting from disease which they had had, as pneumonia, bronchitis, or enteritis. Bouchut also remarks that tetany occurs as a

sequel of various enervating maladies, among which he enumerates cholera, typhus, and typhoid fevers and dysentery. Erb mentions the following diseases which sustain a causal relation to tetany, or in the convalescence from which tetany is liable to occur: typhoid fever, measles, cholera, Bright's disease, febris intermittens, in addition to the diarrhœal maladies which have been alluded to above. Eustace Smith goes further, and states that tetany is rare in robust subjects; that it ordinarily occurs in those who have delicate constitutions by inheritance or disease, or are imperfectly nourished. Gowers, enumerating the maladies which are followed by tetany, mentions "typhoid fever, cholera, smallpox, rheumatic fever, measles, febricula, catarrh, and pneumonia," and he states also that in young children the indications of rachitis are rarely absent.

Another recognized cause of tetany is taking cold. Exposure to wet and cold has in numerous instances been followed by tetany. From this mode of origin the opinion arose that tetany is a rheumatic affection. Hence Eisenmann applied to it the term *brachiotonus rheumaticus*, and Benedict designated it *rheumatische contractur*. Erb says, "Amongst the exciting causes catching cold is both the most important and the most common, and this statement," he adds, "is supported by the fact that many physicians have regarded it as an exquisite example of rheumatic disease. Working in the wet or cold or in water, sleeping on the damp ground, have very often been regarded as causes, and the swelling in the joints, which occurs in many instances, indicates that this disease has a somewhat close relation to true rheumatism." It must be recollected that Erb's observations have been chiefly with adults. As regards infancy and early childhood other causes of tetany are apparently more common than taking cold. Adults with tetany often attribute the attack to exposure in wet and inclement weather, and probably correctly. At the present time, in Charity Hospital, a female aged thirty-nine years is under treatment for tetany. She said that her sickness was produced by exposure in wet and cold weather. She was employed as a seamstress, and, being insufficiently clothed, sat at her work with feet chilled and wet. At the same time her menstruation had been irregular, and she had diarrhœa apparently produced

by the exposure. Tonic contractions occurred in the muscles of the fingers and toes on both sides, accompanied by pain, especially in the affected muscles of the lower extremities. Several months have elapsed since the commencement of the disease, and the fingers have regained nearly or quite their normal state, but the toes are firmly flexed. The chief cause of the tetany in this case appeared to be taking cold, from which probably the diarrhœa resulted, which, as we have seen, is one of the most common causes of the tonic contractions. Trousseau also relates cases in which exposure to cold was apparently the exciting cause. Gowers also states that next to diarrhœa the most common causes are "exposure to cold, acute disease, and lactation."

Among the other recognized causes of tetany, we may mention suckling, pregnancy, and the development at the time of commencing puberty. The first cases seen by Trousseau in Necker Hospital occurred in women recently confined, who were wet-nursing, so that at first he designated the disease *rheumatic contraction occurring in nurses*. Gowers says that the frequency of the disease in adult women is chiefly due to maternity. The following are occasional causes mentioned by various writers: anæmia, prolonged muscular effort, alcoholism, onanism (Gowers), ergotism, violent excitement (Erb), irritation of uric acid calculi (Eustace Smith).

From the nature of tetany it would seem probable that it might occasionally result from preputial irritation, but I have not been able to find the history of any case in which this cause was assigned, either in the literature of tetany or in monographs relating to a narrow, irritated, or inflamed prepuce. Tetany does not result, or very rarely results, from burns or ordinary wounds; but Weiss in 1883 reported thirteen cases in which it occurred from excision of the thyroid, and, according to Wölfler, in seventy cases of this operation tetany resulted seven times.

It is remarkable that this disease appears to occur as an epidemic, a fact not easy of explanation, unless upon the supposition that the rheumatismal cause due to atmospheric conditions, or the psychical or emotional cause, giving rise to irritation, is operative at the time. Bouchut says that tetany

occurred as an epidemic in Germany in 1717, in Belgium in 1846, and in Paris in 1855. In the Paris epidemic it occurred equally among children and adults, and was the occasion of interesting observations by Aran and Barthez. Another epidemic occurred in Paris in 1876, and in its environs, especially at Gentilly, where in a school the teacher and thirty pupils were affected; but some of the pupils afterwards confessed that they had feigned the disease. In New York city, in the first quarter of 1889, I saw so many cases that it seemed to me that tetany might properly be regarded as an epidemic.

(To be concluded.)

THE TREATMENT OF NÆVUS BY THE INTRA-INJECTION OF ALCOHOL.*

BY THOS. H. HOLGATE, M.D.,

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IN perusing the literature on the treatment of vascular nævus for the past twenty five years, it will be found that, in order to cause a metamorphosis or removal of the vascular structure, the treatment has been various, and has, I think, kept pace with the advancement of the science of medicine generally, as will be observed from the methods of treatment used, which will be named in their order as I have gathered them, from year to year, from the medical press, beginning with the local application of a strong solution of the perchloride of iron. The compound tincture of iodine locally applied dissipated two cases which were small in size, but it did not succeed in those of larger dimensions.

Dr. Cumming used a plaster of tartar-emetic, one gramme to four of galbanum plaster, and succeeded in eight cases. Collodion and collodion with corrosive sublimate has been

* Read before the Section on Pediatrics of the New York Academy of Medicine, April 11, 1889.

used successfully, and others have been destroyed by pencilling the surface of the nævus with creosote. Vaccination on the nævus has been resorted to with varying success. Caustic potash and strong nitric acid have been used, but leave a scar, which is not unfrequently as unsightly as the growth which was sought to be removed. Injection of the perchloride of iron into the structure has been successful, but is not without danger, as will be observed from the case of nævus on the nose of a child treated by Dr. R. B. Carter in this way in 1865, with ten minims of the preparation, resulting in instant death. Although usually successful, others have had similar experience in its use.

The passing of setons through the growth has cured some cases, and others have been cured by ligating the tumor beneath pins passed through it.

Excision has been resorted to, but is objectionable, on account of the excessive hemorrhage which occurs and the unsightly scar which is not unfrequently left. The double ligature has been used, by passing it through the tumor and tying it in halves, then surrounding the whole with another ligature. Passing needles heated to a blood red through the tumor a line apart, has been practised successfully, and the actual cautery has removed others. Making an incision into the tumor, cutting it out piecemeal with scissors, and controlling the hemorrhage with pressure, has been successfully practised. The passing of sutures soaked in a solution of perchloride of iron through the tumor has proved effectual, and also the injection into the tumor of a solution of tannin. The repeated injection of two minims of carbolic acid has cured some, and the electric cautery others.

The *écraseur* applied beneath harelip pins has successfully removed some, and painting twice a day with glacial carbolic acid with just water enough added to make a solution, or water four grammes, glacial carbolic acid thirty-two grammes, has proved curative. The elastic ligature applied beneath harelip pins passed through the tumor has proved effectual in removing them; also repeated scarification followed by a compress. Forty cases have been reported cured by electrolysis. The passing of a silver wire around the nævus beneath

the skin and bringing it out at the point of entrance, then tightening the ligature by degrees, has been practised, and causes the tumor to subside without a scar.

Dr. Bligh recommended painting daily with liquor plumbi subacetatis, and says it will cure in from one to two years, depending upon the size of the nævus. Dr. Little succeeds by making punctures in the nævus one-sixteenth of an inch apart, and Dr. E. Owen and Mr. Coates by injecting the tincture of iodine.

The application of the ethylate of sodium, and also of the ethylate of potassium, introduced by Dr. Richardson, either of which will prove successful, by acting upon the part as a caustic, and is to be applied locally, from time to time, until the cure is effected. This, I believe, is the latest, excepting the one to be introduced to your notice to-night.

Mr. George C. consulted me on November 5, 1885, in regard to a vascular nævus on the external and lower aspect of the right ala nasi of his son, aged four years, which in size was about half that of a filbert, and gave to the child a very uncomely appearance. At birth it was a small port-wine mark, on a level with the surrounding skin, after which it gradually increased in growth to the dimensions named, and became pendulous at the lower margin of the ala. It had on several occasions bled quite profusely from the pendulous margin, the parents having found no little difficulty in arresting the bleeding. It was soft and compressible, but, on removing the pressure, it immediately resumed its former size.

On the 17th of November, Mr. C. brought his son to have the nævus removed. It being located in so prominent a position, and not desiring so to operate upon it as to leave a scar, being in a difficult position to exert pressure upon the part by mechanical means to arrest hemorrhage if the method of scarification was adopted, I determined to try injecting the nævus subcutaneously with ninety-five per cent. alcohol, and applied a clamp—as is used for operations on tumors of the eyelid—around it to arrest the circulation, then, with a hypodermic syringe needle, passed into it through its centre longitudinally near its base, I injected from five to seven minims of rectified spirit of wine, gradually withdrawing the nozzle or needle

of the syringe as the injection proceeded, the result being the entire solidification of the tumor.

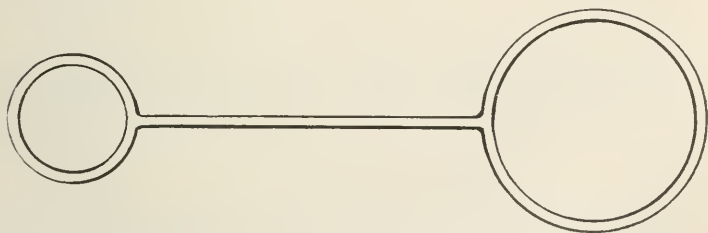
On the 30th of November the nævus had become softer and considerably shrunken, when I passed the needle of the syringe into the upper part of the tumor near its base, and again injected alcohol, in order to coagulate the blood in it and induce adhesive inflammation in the vessels at the source of its supply without again putting on the clamp. The tumor, as before, hardened, and the skin for some distance around it became pale. No untoward symptoms followed, the skin soon resumed its normal appearance, and on seeing it again on February 9, 1886, it was found to be reduced to one-eighth of its former size, at which time and on April 21, in the same year, it was again injected. The ala nasi is doubtless the most difficult part of the surface of the body on which to treat a nævus in this way. On account of the sparseness of cellular tissue beneath the skin, the blending of the skin so closely with the cartilage, and the part operated upon having so nearly resumed its normal condition, it was with difficulty that the needle of the syringe could be passed into or beneath the skin, consequently the two last operations were not as markedly successful as the ones previously, the tissue being less redundant and more difficult of penetration; the nævus has been so reduced, and the skin covering it, it will be observed, has so nearly resumed its normal appearance, that an ordinary observer would not readily notice a difference in the two alæ, unless his attention was specially called to it, and that without other treatment, excepting the painting of the part, from time to time, with glycerin during the process of absorption, and no scar is left, excepting in the part where it had previously ruptured spontaneously and bled.

On December 10, 1886, Mr. P. called my attention to a nævus on the anterior aspect of the chest of his boy babe, aged two months, which at birth was little more than a port-wine mark, but rapidly developed into a vascular nævus, in dimensions nearly the size of the one last named. I exerted pressure around this by encircling it with a ring, in order to arrest the circulation to and from the part during the process of injecting the alcohol, and but one injection into the nævus

was given. I gradually removed the pressure shortly afterwards. The injection not only arrested its growth, but caused its disappearance as a tumor. At this date, January 20, 1889, it is level with the surrounding skin, and three-fifths of the surface has resumed the normal color of the skin; the remaining two-fifths has the usual port-wine color, which the mother thinks is gradually disappearing, and the operation has left no scar.

I saw the case again, a few days ago, and found the remaining telangiectasis slightly increased, having encroached upon the part cured, and also upon the skin beyond the growth, as will be observed from the stated condition on January 20, and its condition now, April 11. The child since the former date has had scarlatina in a mild form, which may have had some influence in arresting its favorable progress, or the effect of the operation may have expended itself. Whatever the cause may be, I do not look upon it as lessening the efficacy of this method of treatment. The remnant, as I have stated, is a mere port-wine mark, and can be removed by further injections or by very superficial scarification. I propose, however, to recommend the external application of alcohol to it twice a day, and, if successful, I will report it in future.

I present to your notice an instrument having a ring at each end,—one six and the other eleven lines in diameter,—



which an ingenious person can make from an ordinary knitting-needle, by which all the pressure needed can be exerted around a nævus during the injecting process, and I would recommend its use in all feasible cases, as it confines the alcohol and prevents it from being diffused for the time being further than within its confines, and causes it to have a more powerful

effect upon the fluids and tissue within its area; and the alcohol, by contracting the vessels beyond the nævus, more effectually prevents any coagula therefrom entering into the general circulation.

In treating nævus of larger dimensions more than one injection could be given at the same sitting, or at short intervals of time in different parts of it; the absorption in one part could be taking place while another part was being prepared, bearing in mind the effect of alcohol upon the system. This method has the advantage of being easy of application; and there are few practitioners who are not possessed of all the material needed; if not, it is readily procurable, and with ordinary care it will, I think, not prove dangerous. In stating this, I have reference to necessary care being used that the syringe is perfectly void of air before injecting the agent. I have not tried this in the treatment of goitre, but believe, from its effect in these cases, that it may be tried with a reasonable hope of success.

I have no knowledge of the treatment of nævus by this apparently easy and efficient method previous to the cases here recorded and presented, and will be pleased to learn the result, through the medical press or otherwise, from others when it is more generally used.

206 WEST FOURTEENTH STREET, NEW YORK CITY.

THE ORTHOPEDIC TREATMENT OF TUBERCULAR DISEASE OF THE KNEE IN CHILDREN.*

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THE wording of the title has been chosen with a view to bring before the Society that management of a tuberculous knee which should contribute to the prevention as well as the correction of a deformity, and at the same time restoration

* Read before the New York State Medical Society in February, 1889.

of function, when such is possible. I do not come to-day to present any new forms of apparatus or to bring before this Society any that cannot be employed by the members present.

At the outset, then, I wish to disabuse your minds of the idea that orthopedic necessarily means mechanical. Any one who will take the trouble to look up the derivation of the term will find that it means prevention as well as correction.

The great advances surgery is making in early diagnosis prompt me on the present occasion to appeal to you on behalf of early diagnosis of diseases in and about the knee. I take it for granted that the average practitioner has learned something of anatomy and physiology. Many, I know, are familiar with anatomy only as it exists in the dissecting-room ; but this knowledge ought to be a sufficient basis for the study of superficial anatomy.

In studying fractures and dislocations, we naturally fix upon certain landmarks about a joint, the presence or absence of which assist us in diagnosis. It seems to me fully as important that this same knowledge should be brought to bear in our study of diseases which present such constant signs. The fact that the large majority of our patients have two knees instead of one, and the further fact that a chronic disease seldom, if ever, invades both knees at the same time : these facts, I say, place us at once in possession of a means of comparison.

When a case of lameness involving the knee-joint presents, we can easily examine the sound knee with our sight and with our hands, thus familiarizing ourselves with the normal appearance, the normal feel, and the normal function of the joint. At the same time our knowledge of the anatomy of the part will come to us, and we have thus taken the most important steps in securing a diagnosis. We can now proceed quite intelligently with the knee affected. We have by this time learned something about the history, which, of course, gives us the mode of invasion. Those who have pinned their faith slavishly to the traumatic origin of joint-disease will have by this time discovered some particulars of a fall or other injury. Before attaching too much importance to those particulars, it is best to learn definitely the date previous to which the child

was not lame. It so happens that many of these cases now under consideration were "a little lame" prior to the date of the trauma. The teachings of the present day are sufficiently explicit to call our attention at least to the osseous origin of what is understood as "white swelling," which is the tuberculous disease mentioned in the title of my paper.

Assuming, now, that the pathology to which I have just alluded is correct, we can readily explain not only the fall, but its influence on the disease itself. An acceptance of this view enables us to excuse the awkwardness and unsteadiness of the limbs, and give to the fall its proper place in the history of the case.

I have made this little digression in order to emphasize the pathology of what is known as common tumor-albus or white swelling. In returning now to the diagnosis, I would have you bear in mind, during the examination of the case, that the early signs must be found in the bone and in the muscles which take their origin or insertion on the bone under examination. The large extent of the synovial membrane of the knee enables us at once to recognize the presence of increased fluid. If the membrane be distended, flexion of the knee will give us symmetrical fulness on either side of the tendon of the quadriceps femoris.

The position and mobility of the patella present for consideration. Proceeding thus with our comparative examination, we can appreciate any changes that may have occurred in the superficial parts of head of tibia or the femoral condyles. Without going more extensively into the question of diagnosis, I shall content myself with the few hints I have thrown out, and proceed at once with the management of a case of tubercular osteitis of the knee in the early stage,—that is, the pre-arthritic stage.

The strong tendency of the tuberculous foci to be multiple prevents us from adopting prompt operative measures and compels us to rely upon what might be termed expectant procedure. If, for instance, we could feel sure that a single focus existed in the immediate neighborhood of the epiphysial line, we could easily reach this focus and terminate the disease in its inception; but the signs which belong to a single focus

belong with equal distinctness to two or more foci, hence surgeons are loath to invade the epiphyses on such uncertain testimony.

Early operative interference, such as trephining, gouging, and igni-puncture, have not been looked upon with favor by the majority of surgeons. In my own practice I have pretty uniformly relied upon immobilization and rest, as the best means of bringing about resolution. There are very few children on whose knees the plaster-of-Paris bandage cannot be used with advantage. When I say the plaster-of-Paris bandage, I mean the bandage neatly and smoothly applied, made quite thin, and finished well at the upper and lower edges.

From a teaching experience of four or five years with this agent, I am fully convinced there is no dressing more abused. Any kind of plaster is regarded as sufficiently good; any kind of material for bandages is regarded as good enough; and excessive weight and clumsiness are too often looked upon as all that is necessary in a plaster-of-Paris dressing. One cannot expect to prevent deformity by work of this kind. Resolution of inflamed bone does not take place under such irritating dressings. If one expects to employ plaster of Paris in these early lesions of the knee, he should familiarize himself with its proper application. Water-glass makes a neat dressing, yet this cannot be applied by the novice. If one realizes the gravity of the lesions with which he has to contend, if he realizes that this lesion is a tuberculous inflammation of the epiphyses, he will not only adopt that splint or that dressing which will prevent deformity, but he will hold himself responsible for the maintenance in position of the splint or dressing. If the child is old enough to walk, a splint in the shape of a perineal crutch can be employed, and the necessary rest to the joint be secured. The bone and joint need to be thus protected for two or more years.

If any of my hearers believe that prolonged immobilization is harmful and productive of ankylosis, I will say the testimony is inconclusive, and that, so far as my own experience goes, the real function of the joint can be better preserved by absolute immobilization than by any attempts at

passive motion. I have omitted to mention traction as a means of fixation, because of the difficulty of securing continuous traction of the joint in all cases, especially in the hands of one who does not follow the special form of traction apparatus employed. Hence my omission to dwell upon this agent in a communication. I wish to be eminently practical. I *do* want to emphasize in this place the necessity for a large amount of patience. Because the thickening about the condyles, or the ligamentum patellæ, does not rapidly subside, because the tenderness on handling persists; because reflex spasm on the slightest motion remains an obstinate feature, because the change in contour lasts a long time,—it does not follow that a cure is out of the question. A tuberculous process in the epiphysis is just as chronic as one in the lung. Sporadic cases of prompt recovery after operation do not by any means establish rules. I have myself performed nearly all the operations upon the knee, and often with flattering results. At the same time I am thoroughly conversant with the wonderful cures that have been accomplished by expectant treatment. It is the individual case that demands our best surgical judgment. I may be permitted to insist upon the rule “prevent deformity.”

Management of the state of deformity.—For many reasons we seldom get cases before the stage of deformity has been reached. How to correct these deformities was a problem that confronted me for a number of years. The different splints, so well known, have failed in my hands to get thoroughly satisfactory results. I have been able to accomplish a certain amount of relief; yet how to retain the good already accomplished has not always been an easy task.

When the deformity is uncomplicated flexion, the management of the case has been comparatively easy: when the element of subluxation complicates the flexion, the usual traction splints with screw or rack and pinion are totally inefficient.

I take pleasure in presenting a very simple apparatus, which has served me a most excellent purpose during the last eighteen months. My attention was first called to the appliance by Dr. Hector Cameron, of Glasgow. He got the idea from Billroth's clinic. It may present some similarity to the sector

splint;* it consists of two tin strips joined by light steel bars and incorporated in a plaster-of-Paris bandage. It is necessary, in applying the plaster, to have the bandage thick in the popliteal space, and to leave uncovered a space just below the patella. A few practical points on the application of a bandage may not be out of place, and they are as follows: Have the tin splints fitted well to the limb before you begin the dressing, with your hand or with a pair of wrenches. Shape the steel bars over the salient points of the knee; place pads of piano felting or double-faced canton flannel over the patella, over the head of the tibia, and over the posterior aspect of the thigh a few inches below the perineum. Be sure to get the joints of the splint opposite the articulation. When the plaster of Paris has been applied, and before the setting is complete, with a sharp knife make a transverse incision through the bandage filling the popliteal space. Next day the leg can be forcibly extended to the pain limit and a wedge-shaped piece of cork inserted in this popliteal incision. The management of the case is simply this: every few days, or from day to day, according to circumstances, make a little extension, and retain what has been gained by means of the cork.

If there be subluxation, the steel bar passing from the fan-shaped tin pieces intended for the thigh should be curved upward and have a long slot through which the screw can pass, thus enabling one to change the centre of motion. We gain thereby a better purchase on the subluxated tibia, the arc of motion is changed, and in it we have a very satisfactory procedure. If knock-knee exists, the splints can be placed on the anterior and posterior aspects of the limb and the cork inserted in the opening on the outer side.

Clinical cases present various degrees of resistance, and the time employed to correct the deformity varies. If it is important to hasten matters, an anæsthetic may be employed, the

* Dr. Stillman, the inventor of the sector splint, very properly lays claim to the slotted bar of the knee-splint, for this is a step in the evolution of the sector splint. The clamp for securing the amount of extension gained in Dr. Stillman's splint is not employed in the one here described, but cork, which is elastic, serves to retain the extension secured by manual force.

limb forcibly stretched, cork inserted, and the patient placed in bed for a few days.

The most important feature in the management of the cases is the retention of the good position obtained, and for this purpose I apply a solid plaster-of-Paris bandage; and in order to protect the joint, use the Thomas knee-splint, with which most of you, I presume, are familiar. It consists of two rings with bars running parallel to the limb, the upper ring fitted to the thigh and well padded for a perineal crutch. A three- or four-inch-high shoe or patten on the sound foot completes the apparatus. This is worn for several months after tenderness and infiltration has subsided, when the test for soundness of the joint is employed as follows: Remove all dressings and let the patient use the limb cautiously for a week or more, and if range of motion has increased during this time the limb may be regarded as sound; otherwise, re-course must be again had to the apparatus.

Abscesses are managed according to circumstances, and so long as they seem to be harmless are not interfered with. Should they present troublesome features, they are opened and treated antiseptically, the foci of disease are scraped and gouged, and arthrectomy more or less complete is resorted to. The use of the splint after the operation is very essential. The above course of treatment has had with me most gratifying results, and excision is seldom necessary.

NOTES FROM PRACTICE.

BY JEROME WALKER, M.D.,

Brooklyn.

MOISTURE AND HIGH TEMPERATURE OF ROOMS IN THE TREATMENT OF CASES OF DIPHTHERIA.

WHEN a visiting physician to the Sheltering Arms Nursery, in this city, one of the bath-rooms was so arranged that it could be very rapidly filled with steam from the steam-heating apparatus. The exposure of young children during the paroxysms of croup to its influence was generally attended

with good results. But moisture and high temperature of the room, in this bath-room or elsewhere, was seldom of service in cases of diphtheria. In fact, the steam from heated bricks put into water, evolved from the slaking of lime, produced by steam atomizers, was either inefficient and annoying or so overpowering that sometimes the patients became excitable and were not readily controlled if the steam appliances were in the room. In some instances the heat and moisture seemed to actually make the disease spread by softening the mucous membrane and opening up new spots for infection. The heat of the room made necessary in accumulating the steam was associated with the retention in the room of close, confined air, which of course was impure. These conditions often seemed to me to weaken the general strength of the patient and to do more harm than good. Still, with a blind adherence to a common practice, and with respect for the teachings of authorities, I continued—especially in cases where there was a tendency to laryngeal inflammation—to use occasionally steam and overheated rooms. Now, after the lapse of years, and after much thought, I am thoroughly convinced that such treatment is very uncertain and frequently harmful. The occasional inhalation of warm medicated vapor is undoubtedly of value if it can be used without overheating the room and distressing the patient. Many nervous children dislike to have the spray from a steam atomizer strike their faces, and also dislike the noise it makes. Some one has suggested that a tent can be readily improvised about the patient by suspending an umbrella from the ceiling and wrapping around it, and pendent from it, a sheet or blanket. Steam may be admitted into this tent and the air of the room still remain good and of a moderate temperature. There are but few cases, I take it, where the patient does not need, from time to time, air to breathe which is not very moist or overheated, but is refreshing, and this is obtained by pulling aside the tent door and admitting the air from without. Of course, some cases need to inhale more vapor than others, to relieve suffocative breathing. A convenient method of introducing steam into such a tent is by the use of the following apparatus: Have made a conical stand of sheet-iron, securely riveted together, as all parts

of the apparatus should be if much heat is to be used. Soldered tin is uncertain. The open top of the cone should be at least ten inches in diameter, the open base twelve inches or more. Around the lower portion of the stand there should be numerous air-holes of at least three-quarters of an inch in diameter. The stand should be either on short legs or have a capacious door in it, so that a gas-stove, coal-oil stove, or *generous* alcohol-lamp may readily be admitted under or into it. Into the top of the cone should fit a sheet-iron reservoir capable of holding at least two or three quarts of water. In the top of the reservoir there is a collar one inch in height and one and a half inches in diameter. There is also a corked opening to admit any liquid to be vaporized. To the collar are attached joints of pipe, each from eight to twelve inches in length. There are also one or two elbows, and a funnel-shaped end-piece near the patient. To prevent condensation, the joints, elbows, and funnel-end should be covered with felt or other material used to cover steam-pipes. With a good stove or lamp furnishing the heat, with a good draught of air, such an apparatus is effective, makes no noise, is readily supplied with water, and does not need the almost constant attention that many steam atomizers require. Substituting for the reservoir a shallow sheet-iron pan, calomel or other powder can be volatilized. Some such method as the above of applying steam and vaporized drugs and chemicals frequently to the throat and nasal passages does not imperil the air of the room. My judgment and experience tell me that to keep a patient with diphtheria for a considerable time in a room with a temperature of 80° F., or more, without ventilation, is to increase greatly the danger of heart-failure.

SEA-BATHING FOR VERY YOUNG CHILDREN.

Parsons, in his little work on "Sea-Air and Sea-Bathing," states, "It will be obvious to most people that neither the very young nor the very aged are fit subjects for sea-bathing. We have elsewhere expressed the opinion that all the benefit which is derived from sea-bathing in infancy can be obtained just as well from the use of sea-water in baths at home, without the agonizing fright which is almost inseparable from

immersion in the open sea, and the risk of injury which such terror may produce." Dr. Brochard, in his work with a similar title, says, "No child under three years of age, with rare exceptions, of which the physician will judge, should be subjected to cold sea-bathing. The wide expanse of ocean, the noise of the waves, the suffocative feeling which the water occasions them, all unite to inspire infants with terror, and to convert for them a practice so salutary, at a little more advanced age, into one of suffering and even danger." As physician for ten years to the Brooklyn Sea-Side Home for Children, at Coney Island, I have had abundant opportunity to test the two statements given above, and experience forces me to disagree with them in a measure. On looking over my note-books I find such cases, for example, as the following: "July 8, 1878. G. S., æt. sixteen months. Mother's family consumptive; child never strong; had pertussis last fall; not rallied well from it. Bowels are constipated; anorexia; cutting teeth. R Frequent dip-baths, and phosphate of soda in child's food. July 13. Child went home improved greatly." "July 23. F. M., æt. nine months; nursed. Six weeks ago had erysipelas, following vaccination; now a catarrhal diarrhœa. R Baths and pepsin mixture. July 26. Went home, strong and with no diarrhœa." "July 29. D. C., æt. twenty-one months. Weaned in March last; is a puny baby. R Beef-tea twice a day in addition to ordinary food; baths. August 4. Sent home this P.M. in good condition." "July 15. I. F., æt. nine months; nursed and fed on everything at table. Sick for a week; watery diarrhœa; yellow, bad-smelling stools; vomits occasionally; is pulled down. R Dip-baths; nurse only; water and brandy. On 16th, hydrargyrum cum cretæ was given. On 17th, baths only. Child recovered."

Records show no bad results from these dip-baths *in the ocean*, probably because I or my assistant did the bathing. It was not left to the mothers or to the nurses even. Of course, great care was taken that no child should have such a bath if frightened or chilled, or if the day was very hot, or the air or water very cool. Those who could not have a sea-bath, did have a bath at the Home, with salt water warmed by exposure

in a pail to the sun's direct heat. It is noticeable that unpleasant results did occasionally follow these baths at the Home, presumably because the persons giving them (generally the mothers) were not as careful as they should be. The number of children who had the dip-baths greatly exceeded the number of those bathed at the Home, and included within the ten years several hundred children under three years of age, with many under one year. Among these were puny children, children with gastritis, gastro-enteritis, rickets, bronchitis, non-contagious skin eruptions, joint diseases, and scrofula. The method of giving the bath was as follows: The child, in the arms of the mother or an attendant, was protected from the sun's heat by an umbrella, and had on clothes easily removed. When the doctor was ready to take the child, the clothes were removed, with the exception of the diaper, drawers, or a petticoat. The doctor, taking the child in his arms (soothingly, if necessary), *gently* wets the head, face, neck, and shoulders of the child with salt water, and then dips the child once or twice only into the ocean, the water coming up to the chin and not beyond. The child is then gently rubbed with the hand and given to the mother or attendant, who dries it immediately with a large bathing-towel; it is then wrapped in a shawl or blanket for two or three minutes, and then dressed, taken to the Home, and there given something warm to eat or drink.

I have been particular to give these details, for, in my judgment, upon the *way* in which a sea-bath is given depends its value with young children, rather than that the age should determine the kind of bath. In my judgment, sea-water that has stood in tanks or pails for a considerable time is not to be compared for bathing purposes with the live, fresh water in the ocean. It is a common sight at the sea-shore to witness children playing in pools of water, more or less dirty or slimy, that have been formed by the retreating tide. Parents know that in these pools there is no danger from the undertow, but the water is lukewarm and weakening. A careful dip or two in the live, fresh, invigorating water, and the salt air blowing upon the skin, combine to do the greatest good even for young children.

THE PHYSICAL TRAINING OF GIRLS.

BY BERTHA E. BUSH, M.D.,

Chicago, Illinois.

THAT the mental education of girls is largely carried on at the expense of bodily development is a somewhat hackneyed assertion, and forms the basis of many a tirade against the modern school-system. If it be true that "the first requisite of success in life is to be a good animal," how unsuccessful most of our girls must be! And why have they not this first requisite? Why have they not strong, healthy bodies? Is it because of inherited weakness, because they were born with a tendency towards disease? Yes, in some cases; for the average girl has not always a healthy mother. But, on the whole, nature gives most of us a very fair start. The little girl of six, just entering school, is about as rosy and active as her brother. At sixteen she has by no means kept pace with him physically, and at twenty-six she has fallen so far below his standard of health that she probably never reaches it again.

Where are we to find the causes of this? Obviously not in the parentage, not in the hygienic conditions of the home, nor in the food, for these are common conditions; but in those features of education peculiar to each. Some of the objectionable points in the girl's training demand our especial attention.

First, let us consider the matter of dress. The present mode of clothing children is said to conform much more nearly to the laws of health than did that of twenty years ago. Still there is room for improvement, for in many respects it fails to promote health. It restricts freedom of motion in the body generally, and directly impairs the action of some of the vital organs, notably of the lungs; it does not sufficiently protect the body from changes of temperature.

Another serious defect in the education of girls is the lack of proper exercise. No principle of physiology is better known than the fact that the moderate exercise of a part

causes it to grow stronger, while its non-use results in weakening or incomplete development. Especially is this known to be true during the period of growth. Yet it is at this time, when the organism is so easily influenced, that girls are most closely confined to the house, studying school-lessons and acquiring accomplishments many and varied,—learning a little of almost everything, except how to take care of their own bodies. With this amount of enforced sedentary work there is small chance to exercise the muscles or fill the lungs. The whole system suffers from such unnatural inactivity. Appetite and digestion are impaired, circulation feeble, excretion imperfect, and nerves irritable. These disorders would inevitably result in illness if it were not for the wonderful adaptability of the organism to external conditions. The contrast between the freedom of early childhood and the artificial quietude of the high-school period is certainly strong.

Besides being uncomfortably dressed and restricted as to exercise, girls suffer in their occupations and amusements. We are not now considering those children whose poverty compels them to perform work unsuited to their years, nor those whose moral surrounding are exceptionally bad. We speak of the girls in the great majority of well-to-do families, and of such we assert that their occupations and amusements are not wholesome. These girls are in school three-quarters of every year from nine to four each day. During this time the body, if not actually weakened, certainly gains little. The short recesses and the physical exercises of the school afford, at most, only a brief rest from the wearisomeness of sitting still. Throughout these school-hours the attention is fixed upon the mental work in hand. It needs but little school-room observation to know how keen is the competition and how close the interest in class-work, especially among older girls. To win the approval of teachers and a fair standing in class the closest application is necessary. School-hours are not long enough for the requisite amount of study, so the work is brought home. Several grammar-school teachers, whose pupils ranged from twelve to fifteen years of age, were asked, "How much do your girls study at home?" Their answers were, "From one to three hours a day." "Is this home study

necessary?" "It would be impossible to complete the work of this grade in the time allowed without it." Add, then, to the actual work done in the school-room an average of two hours' study at home, and we have the amount of the mental work required by the common school. Besides this, many girls practise on the piano an hour or more daily, and most of them learn something of sewing and other womanly arts.

Considering that all of this work is done in the sitting position, we might reasonably expect to find the recreation of girls active in character. Exactly the opposite is true. Little girls, indeed, may, and do, to some extent, share the out-door sports of their brothers; and so long as this is allowed there is none of that physical inferiority which becomes so apparent later on. During the first few years of school-life, when the sessions are short and mental work easy, play is active and abundant. Gradually all these conditions are changed. Lessons longer, harder, and more numerous occupy more and more of the girls' time, while music and home duties must receive some attention. Worse than all else, at this period of childhood, are the social restrictions which make it "improper," if not reprehensible, for these children to play out of doors. It is considered wrong for girls to engage in any active games, as boys do, after a hard day's study. The noisy, vigorous play in which all children delight is very early forbidden to girls as being "rough and unladylike;" and it is a significant fact that the substitutes for such play provide almost no muscular exercise at all. An occasional walk or ride and a few decorous games, involving very slight exertion, make up their out-door activities; and even these are often deprived of every characteristic of spontaneous play until they become distasteful. Partly from this cause and partly from actual weakness, the result of deficient exercise, school-girls come to pass more and more of the time in-doors and to find quieter forms of amusement, such as dressing dolls, making scrap-books, drawing and painting, reading novels, making and receiving calls. Compare these with foot-ball and coasting. Contrast the physical value of a Saturday *matinée* with that of a game of base-ball. After ten years of the ordinary regimen, the wonder is that girls have any muscle at all.

We can only briefly mention some of the less constant defects in the training of girls. Irregularity of habits, especially the loss of sleep; over-stimulation of the emotions; eating not enough food or not the right kind of food; breathing overheated and impure air,—all these react with speed and certainty against the vigor of the constitution.

A thoughtful parent lately remarked, "It is easy to see that the present system is wrong, but it is not easy to find a better one." Much has already been accomplished in the way of reform, and parents can do more in this matter than any one else. They can certainly provide comfortable clothing for their daughters; and this, too, without going to the extremes some of the dress-reform advocates would have us believe necessary. A dress which meets every requirement of hygiene need not be ill-fitting, expensive, nor odd, and may be very pretty. That it be light, and loose enough to permit reasonably free motion, and warm enough for the season,—these are the essentials, and they are every year becoming more widely recognized. It is encouraging to note, in nearly every school-room, a few girls who are sensibly dressed; the increase in their number is evidence of a growing interest in this subject among parents and teachers and the girls themselves.

When it becomes a physical possibility to move freely, motion is enjoyable, and in the form of spontaneous play constitutes one of the most natural expressions of child energy. For young girls, lively out-door games furnish the best of exercise. Older girls, however, will not continue these, under our unfortunate idea of propriety, and for them a kind of artificial exercise has been devised. We mean gymnastics. The results obtained from systematic bodily drill, in private classes and schools, have awakened a general interest in the subject. In Milwaukee, Kansas City, Chicago, Cleveland, and Pittsburgh gymnastic drill is part of the regular school-work. Two years ago there was introduced into the grammar schools of this city a system of physical exercises that cannot fail to benefit girls and boys alike. But here, as in most public schools, the time and room allowed for exercise are altogether inadequate. A common school-room filled with desks is not an ideal place for physical exercise; ten minutes

a day, even with the best of apparatus and instruction, cannot develop any great degree of strength. Besides, the instruction is given in large classes, and individual needs can receive little attention. So far as they go these exercises are in the right direction; the danger is that we expect too much from them. To regard them as sufficient for the physical wants of our girls is preposterous! Formal, monotonous exercises can never compensate for the loss of play. Spencer says, "The extreme interest felt by children in their games, and the riotous glee with which they carry on their rougher frolics, are of as much importance as the accompanying exertion. And, as not supplying these mental stimuli, gymnastics must be fundamentally defective. Happiness is the most powerful of tonics." The responsibilities of parents, then, are in no way lessened because their daughters get a little physical drill at school. There is great need of less sedentary work and more active recreation. Walking, running, riding, skating, rowing, and out-door games should be freely allowed to girls, and the more study required the greater should be the amount of exercise.

On the score of propriety we quote again from the same eminent author: "If the sportive activity allowed to boys does not prevent them from growing up into gentlemen, why should a like sportive activity allowed to girls prevent them from growing up into ladies? Rough as may have been their accustomed play-ground frolics, youths who have left school do not indulge in leap-frog in the street nor marbles in the drawing-room. Abandoning their jackets, they abandon at the same time boyish games, and display an anxiety—often a ludicrous anxiety—to avoid whatever is not manly. If now, on arriving at the due age, this feeling of masculine dignity puts so efficient a restraint on the romping sports of boyhood, will not the feeling of feminine modesty—gradually strengthening as maturity is approached—put an efficient restraint on the like sports of girlhood?"

CYCLOPÆDIA OF THE DISEASES OF CHILDREN.

CYCLOPÆDIA OF THE DISEASES OF CHILDREN, MEDICAL AND SURGICAL.

By American, British, and Canadian Authors. Edited by JOHN M. KEATING, M.D. Vol. I. Imperial octavo, pp. 992. Illustrated with Plates and Charts. Philadelphia: J. B. Lippincott Company. Sold by subscription only.

As there has never been published in the English language any such cyclopædia of the diseases of children except those translated from foreign tongues, it has been with no common interest that we have awaited the appearance of the work, the first of whose four volumes is before us. It is a handsome imperial octavo of 992 pages, well printed on good paper, and freely illustrated. It is a noteworthy feature that photographs from the living and dead subject frequently replace diagrammatic drawings. Though sharpness of outline is in this way sacrificed to some extent, absolute accuracy of reproduction is attained.

A glance at the list of authors of the different articles—or “monographs,” as they in reality are—reveals an unusually large number of names widely and favorably known in the medical world.

The volume opens with a short introduction from the pen of A. Jacobi. The author has always claimed, and still believes, that “pediatrics is no specialty in the common sense of the term,” since infancy and childhood are but “links between conception and death, between the fœtus and the adult.” Yet as evidence of the necessity of special works on the diseases of children are the differences existing in the structure of and behavior of the tissues of adults and those of children, and the occurrence of certain diseases in children only. Among the characteristics of children he calls attention to the peculiarities of the skeletal condition, the excitability of the nerves, the length of the colon, the imperfect development of the salivary glands and pancreas, the peculiar constitution

of the blood, the low arterial pressure, etc. He alludes also to some of the peculiarities of therapeutics, such as the tolerance of quinine, the chemical antipyretics, most of the cardiac stimulants, belladonna, arsenic, and mercury, and the relative intolerance of opium, chlorate of potash, and carbolic acid. Finally, as further proof of the need of good works on pediatrics, he refers to the fact that so little time is allotted to special instruction in this branch of medicine in many of the medical schools, both of this country and of Great Britain.

Part I., General Subjects, begins with an article of forty pages on the Anatomy of Children, by George McClellan, of the Philadelphia School of Anatomy. The author studies the body regionally, describing the anatomy of each portion, and discussing the features characteristic of children. In the light of the recent interest in the topographical anatomy of the brain, his remarks on this subject, as it applies to children, are of interest. The description of the anatomy of the neck is particularly full, especially in its bearing on tracheotomy, and on tenotomy for torticollis. The peculiarities of the foetal circulation are explained and illustrated, and the anatomy of hernia and of the perineum treated at length. A good deal of space is devoted to the consideration of the development and growth of the spine and extremities, and the changes in the bones at different ages; and some reference is made to the accidents and diseases which depend on these conditions.

The "practical bearings" of the Physiology of Infancy are treated of by Angel Money. We note especially very useful practical matter relating to the average weight of children at different ages, and its relation to height. Considerable space is allotted to the physiology of the nervous system, and to remarks on the time at which the various willed movements make their appearance, and the age at which they may be called conscious. The very slow and gradual development of the will and of the senses is brought out very clearly. There is a brief discussion on the physiology of the circulation, blood, pulse, respiration, digestion, dentition, urine, temperature, and skin.

James Finlayson, so well known to us through his work on Clinical Diagnosis, contributes fifty-nine pages of most inter-

esting reading on "Diagnosis" in the diseases of children. To show the importance of his subject he refers to the well-known difficulties attending the examination of a child, and the differences in the symptoms of disease in children and adults. He rather satirically derides the common practice of referring disorders to teething, and says that it is doubtful whether a child is ever made seriously ill by it. He alludes to the necessity of paying strict and respectful attention to the accounts of the mother and nurse, whose constant attendance on the child renders them alert to any slight changes in its condition; lays stress on the importance of the greatest power on the part of the physician to adapt himself to circumstances in conducting the examination; and gives so many other useful hints that lack of space forbids our even alluding to them. He refers to the importance of weight, of the date of walking, and of the progress of dentition in estimating the development of children. With great justice he emphasizes the absolute necessity of care and accuracy in the use of the thermometer, recommends that in many cases it be placed in the rectum, and enjoys a fling at those attempting carelessly to ascertain the temperature in the axilla after iced applications have been made to the chest and abdomen. There are brief remarks on the diagnostic value of pulse, cry, physiognomy, dropsy, and general pains; and some attention is then directed to family history, and the need of a careful and often wily interrogation regarding it. He instances quite a list of affections which must be classified as hereditary to some extent. The remainder of the article is devoted to passing "rapidly in review some of the symptoms which assume special importance in childhood, or which occur under peculiar forms at early ages;" the author thus limiting himself that he may not trench on the special articles to follow.

The article on Maternal Impressions, by William C. Dabney, is a masterly discussion of all that is authentically known concerning this strange subject,—the result of the author's determination to "review the evidence on which the theory of maternal impressions rests." His thorough study of the subject is evidenced by his reference to the very earliest cases on record,—those resulting from the experiments of Jacob with

Laban's flocks. He has collected from various sources ninety cases which seem to him worthy of credence, and has tabulated these; showing the name of the reporter, the journal in which reported, the nature of the impression, the period of pregnancy at which it occurred, and the nature of the defect. He analyzes these cases still further, classifying them in a series of other tables, according to the part of the body involved. Though some of the defects are clearly "errors of development," others are of such a nature that they can only, we think, be attributed to the influence of maternal impressions; and this is the author's confessed opinion. Such a contribution to medical literature cannot but be a standard for reference for years to come.

Barton Cooke Hirst, in the article on Diseases of the Fœtus, refers in a few words to the power of maternal impressions, and then discusses briefly the influence of other conditions of the mother; such as high temperature, defective nutrition, poisons in the maternal blood, etc. The diseases of the fœtus referable to some of the abnormal conditions of the father are alluded to, and the important question regarding the influence of parental syphilis taken up. The author advances proof of the statement, sometimes discredited, that the fœtus can acquire this disease from the mother during pregnancy. The symptoms and diagnosis of syphilis in the newly-born child, or in the prematurely-born fœtus, are then treated of, attention being particularly called to the appearance of syphilitic osteo-chondritis, which is illustrated by several figures. The arguments for and against the possibility of transmission of infectious diseases from the mother to the fœtus are discussed by the author with the careful review of the literature of which we have already learned to know him capable. The positive evidence adduced leads him to adopt the view that such transmission does occur. Non-infectious fœtal diseases, fœtal traumatism, and the diseases of the fœtal appendage are briefly considered.

So little has appeared from the pen of R. A. F. Penrose that those who have learned to value his practical teachings will look with interest at his article on the Care of the Child at and immediately after Birth. The author has employed the same clear, graphic style, and, in fact, often the same

words, which he was accustomed to use in his lectures at the University of Pennsylvania. He is decidedly opposed to the leaving of the cord without ligature,—a practice now obsolete,—and to the custom of ligating and cutting the cord under the sheet, on the ground that it is a sentimental mock-modesty. Though this is largely true, yet policy, to say the least, demands that the feelings of the mother be respected as far as possible. He describes the method of handling the child, dwelling on the necessity of having it held by a responsible person immediately after delivery, and discusses its care when born in abnormal conditions. We notice that the writer makes no mention of Schultze's method of artificial respiration, which is, we believe, generally considered the best. In fact, the chief criticism to be made is that there is given no information whatever to those wishing to know the opinions of others than Dr. Penrose, and that the article will probably be considered as not fully expressing the most recent obstetrical practice as taught by the majority of writers.

J. Collins Warren contributes a few pages on the Closure of the Ductus Arteriosus and of the Umbilical and Hypogastric Arteries, describing the anatomy of these structures more at length than was done by McClellan, and the nature of, and steps in, the changes which take place in them after birth.

Theophilus Parvin writes of the Injuries of the New-Born, explaining the caput succedaneum: its formation, diagnosis, and treatment, when such is required. The true cephalohæmatomata, wounds of the scalp and face, and facial paralysis are discussed in like manner, and followed by some interesting remarks on, and illustrations of, injuries to the bones of the head, trunk, and limbs. The remarks on intracranial injuries give the results of the recent studies of Gowers, Lovett, Osler, and others, and show that the author's contribution is fully up to the times.

The very important subject of Infant-Feeding is discussed by T. M. Rotch, of Harvard University, in an able article of sixty pages, whose perusal gives only the greatest sense of satisfaction, though the limits of this review prevent an extended notice of it. The analysis of milk and foods, with

which the article abounds, were made by Charles Harrington, likewise of Harvard. First in order we would remark a useful table showing at a glance the intervals of feeding and the amount of breast-milk which an infant should receive up to the age of ten months. The composition of, and the variation in, human milk are then considered *in extenso*. The author believes that a woman should nurse her own child ; that the occurrence of the catamenia or of pregnancy, and other causes, sometimes affect the milk injuriously, but that an analysis should always be undertaken before weaning is advised on account of the milk seeming to disagree. Weaning should be done slowly, so that the food best suited can be determined by numerous changes. An analysis of the milk made when the mother was in good condition is of great assistance in constructing an artificial food. He then gives an account of his method of sterilizing artificial food, accompanied by life-sized outlines of the stomachs of infants at different ages, and illustrations of the feeding-tubes which he employs, as well as of the sterilizer. Finally, he considers the chemical constituents of the proper artificial food, details his experiments in this line, and advises how cow's milk is to be modified to make it suitable for infants' use. A very valuable table contains new analyses of cow's milk modified in different ways, and of some of the principal patent foods. He is disposed to condemn the latter as unreliable, since analyses have shown him that they vary from year to year ; and in any case he deems them unnecessary and often harmful. The writer is a recognized authority on the subject, and his opinion is worthy of our very serious consideration. There certainly seems to be no good reason why we should not, as he suggests, make our own food-mixtures, based on the knowledge of physiology and chemistry which we should possess. He is strongly in favor of the mixture proposed by A. V. Meigs, and has used it extensively. Its method of preparation should, however, be slightly modified in a way which he describes.

William H. Parish contributes a few pages concerning Wet-Nurses. The importance of attending to the moral fitness of the nurse is discussed, as is also that of seeing that she is of good general condition. Believing that tuberculosis can

undoubtedly be transmitted through the milk, the author dwells on the necessity of determining that the proposed wet-nurse has no evidence of this affection. As syphilis is the disease most to be dreaded, a thorough examination of the whole body, including the genitals, is to be made, and the woman who refuses to submit to this should, in his opinion, be declined.

The Diet after Weaning is treated of by Samuel S. Adams, who endeavors to "prescribe a suitable dietary for the child, in health and disease, from weaning to puberty." From the twelfth to the eighteenth month the principal food should be milk; and the author decidedly prefers that taken from the general milking, as, indeed, the "one cow's milk" usually is. It is noticeable that he agrees entirely with Rotch in condemning the various infants' foods, on the ground "that {they are "rich in ingredients they are guaranteed not to contain." The article has several bills of fare adapted to the different ages and conditions of the child. Befitting importance is throughout attached to simplicity of diet.

The article on Nursing of Sick Children is from the pen of Miss Catherine Wood, of the Great Ormond Street Hospital for Children, London. Practical experience having taught her the value of minutiae, those relating to the nursing of sick children are carefully considered, and many useful hints may be gathered, which we especially commend to the physician who thinks he always knows more than the nurse. Among matters referred to are the method of bathing and drying, the administration of enemata, feeding, the attendance on infectious diseases, the clothing, and the bed.

Under Nursery Hygiene, L. M. Yale describes first the nursery itself, and the method in which it should be made and furnished, its heating and ventilation, and its proper temperature. Attention is called to the draught of cold air which necessarily exists near a window in cold weather, and the importance of keeping the child away from it. Dressing, bathing, and the care of the food are treated of more at length than in the preceding article. The remarks on the dress deserve careful consideration.

John Dorning, of New York, writes the article on Dentition,

describing the development and eruption of the deciduous and permanent teeth, and then discussing various anomalies, including precocious, retarded, and multiple dentition, malposition of the teeth, etc. He does not believe that the reports of a third eruption of teeth are well authenticated. "Symptomatology and Alleged Disorders of Dentition" is the heading to the chief part of the article. He clearly does not think that teething ever causes any of the disturbances so frequently attributed to it, and quotes Jacobi in support of this position, as opposed to Vogel, who expresses the opposite view. In the presence of the wide-spread difference of opinion upon this point, we regret that the author did not take the opportunity of giving us an extended review of the views of different authorities regarding it.

An interesting contribution is that of Thomas More Madden on the Pathology and Hygiene of Puberty. He refers to some of the published examples of premature puberty in both males and females, and then confines himself nearly entirely to puberty in the female, devoting considerable space to the discussion of the hysterical disorders of this period. He records four very instructive instances of trance, in two of which the termination was fatal. The menstrual disorders of puberty are briefly considered, and chlorosis more fully discussed. On the ground that "strumo-tuberculous" complaints constitute a large proportion of the diseases of this period, the writer says much which is instructive concerning them, but which belongs rather to the departments of other contributors. He deplors the common neglect of bodily hygiene during puberty, the effects of excessive mental work in schools, and the ill results of sexual precocity, of the abuse of tobacco and alcohol, of immoderate attention to the study of music, and especially of the style of female dress.

Part II., devoted to Fevers and Miasmatic Diseases, opens with an article by William Pasteur, which includes General Considerations and Treatment, Simple Continued Fever, and Thermic Fever. As a conclusion to his remarks on the nature of fever and the production and dissipation of heat, he adopts the nervous theory as the best working hypothesis. He next divides the causes of fever into several groups, and

discusses each of these. A brief space is also devoted to the effects, significance, stages, and types of pyrexia in children, while its symptoms are considered more at length. What is said regarding treatment is of decided interest and practical value. Simple continued fever receives short notice. Under this title the author includes a heterogeneous group of affections, whose only common symptom is pyrexia. Among them he mentions abortive forms of the specific fevers and those in which no eruption occurs; the fever of concealed or unrecognized inflammation; that of disturbances of the digestive or nervous system, etc. Thermic fever is believed by the author to be a factor in the rise of the death-rate from enteritis among children during the hot months. He describes very briefly its symptoms and treatment.

J. C. Wilson, already widely known for his writings on the subject, has contributed the article on Enteric or Typhoid Fever. Fifty-six pages in length, it is too elaborate to receive here the extended and favorable comment which it justly deserves. The author discusses briefly the history of the affection, particularly as it applies to children, and then takes up the predisposing and exciting causes. He views it as settled that the disease is due to a bacillus which he describes and illustrates. Pathological anatomy and symptomatology are treated very fully, and attention is called to the points in which they differ in childhood and in adult life. The pathological lesions are, he says, much less extensive than in adults, and the symptoms are generally lighter and more irregular. Delirium is rare, the temperature curve is rarely typical, and defervescence by rapid lysis is frequent. The author brings forward other interesting differences which we must pass over. The complications and sequelæ as seen in children are briefly referred to, and the diagnosis treated very fully. The section on treatment occupies fifteen pages, and is particularly thorough.

Alexander Collie's experience with fevers renders his article on Typhus Fever in Children of interest. Though a systematic, instructive discussion of the subject, it is not so extended or exhaustive as one could desire. He publishes tables of cases which confirm him in deeming it a very mild disorder

in children, and one rarely demanding treatment "beyond a dose of castor oil." Considerable attention is devoted to its diagnosis, especially from measles, typhoid fever, and small-pox. Several illustrative temperature charts accompany the text.

A very satisfactory short article on Relapsing Fever appears from the pen of Roland G. Curtin. The author gives a brief history of the disease, with statistics showing the percentage of cases occurring among children. The symptoms are fully detailed, and in a way which renders the article very convenient for reference ; and treatment is described in the same style.

A long and exhaustive article is that of J. Lewis Smith on Cerebro-Spinal Fever. Having made a valuable contribution on this subject in his work on the Diseases of Children, the author has evidently felt that he could not better what he then wrote, except by bringing it up to date, and leaving out any matter which perhaps seemed to him unnecessary. He has added a more complete history of the disorder, with special reference to its occurrence and distribution in the United States. He has also made some remarks on the symptoms of the endemic form as now found in many of our cities, and has elaborated somewhat the subject of treatment.

Samuel C. Busey contributes a very satisfactory article on Scarlet Fever. After referring in a few words to its history, he discusses etiology at length, calling especial attention to its great contagiousness, the various ways in which contagion has been carried, and the great vitality of the germ. Though believing that there probably is a scarlatinal microbe, he does not think it has yet been demonstrated, and makes a too scant reference to the researches of Klein, Edington, and Thin. He condemns protective inoculations, refers to the varying susceptibility and predisposition of families and individuals, and, though quoting the employment by Jamieson and others of various external applications and internal medication to prevent the spread of the disease, clearly puts but little faith in any method except strict isolation combined with disinfection. The author states his belief in the existence of a scarlatinal diphtheria and of a true diphtheria, and dwells on the

difference between them. Symptomatology is treated of quite fully, and the commoner complications and sequelæ discussed. The remarks on diagnosis illustrate the pressing need of uniformity in nomenclature. Thus the author differentiates scarlatina from measles, rubeola, erythema, and roseola; but one cannot but be at a loss to understand just what conditions are designated by the last three titles, since rubeola is certainly usually synonymous with measles, and the meaning of roseola appears to depend on the idea of the writer using the term. What is said regarding prognosis and mortality might have been elaborated with advantage, and perhaps enriched with some statistics. Treatment is ably discussed; the author claiming that the symptomatic and expectant methods yield the best results, though he describes some of the plans said to be specific. It is worthy of note that he does not share the wide-spread fear of cold water as an antipyretic in this disease.

J. Lewis Smith contributes ninety-five pages on Diphtheria alone. Using former publications of his own as a basis, and enriching them with numerous abstracts from the writings of others, the author has furnished us with a masterly essay, containing so much that it is scarcely possible to analyze it here. The history of the disease from its earliest recognition is given very fully, as is the account of the numerous researches concerning its etiology. The nature of diphtheria and its diagnosis are next considered, and then over forty pages are occupied by a thorough examination of its anatomical characters and symptoms, the portion relating to paralysis being particularly complete. The author's remarks on cardiac paralysis are of great interest. So much has been written on the treatment of the affection that it is a pleasure to see how in this article the chief methods have been collected and analyzed, and recommended or condemned.

A disease so common and so often fatal as Measles is demands, we think, a fuller discussion than F. E. Waxham has given it. Though no division of the subject has been neglected, yet one cannot but reach the end of the article with a sense of dissatisfaction, as though there were something more to be read. For example, the temperature of measles has been variously described by writers, and a characteristic tempera-

ture curve has often been given. To all of this, however, the author makes not the slightest reference. In like manner he seems with a few words to make the diagnosis between measles and rubella easy, whereas practical experience teaches that it is frequently attended by the greatest difficulty.

One of the most able papers, and one which fully comes up to our idea of what an encyclopædia article should be, is that of William A. Edwards on Rubella. The very interesting history of the affection is detailed, and the struggles which it has had to gain the recognition which it now receives as a distinct eruptive disease. The views are quoted of a large number of those who have written regarding its independence. Edwards considers it one of the most contagious of the eruptive fevers, infectious, and more prone to be epidemic than is either scarlatina or measles. The evidence which he brings forward tends to prove that both the period of incubation and that of invasion are variable. We are glad to note that he confirms the observation of many authors, and one which we have repeatedly made, that the rash may in some cases be almost indistinguishable from that of scarlatina, and in others greatly resemble that of measles. The character of the eruption, the symptoms of the eruptive stage, and the complications which may arise are fully discussed. The article contains a very satisfactory table for differential diagnosis.

Pertussis is treated of by T. M. Dolan, who is well known in connection with the literature of the subject. After considering its history and mortality, and showing by statistics that it is one of the most fatal of the diseases of infancy, he writes at length of its pathology. He describes the bacteriological experiments of Afanassieff and Burger, and adopts the view that the disease is due to an active, living, infectious germ, whose particular determination is to the lungs. He then considers the pathological conditions which result from the persistence of the disease, the phenomena of the kink, and the subject of symptomatology. To treatment we turn with great interest, hoping to learn something new about the management of this troublesome disorder. Much that is useful is to be found here regarding prophylaxis, the necessity of isolation and disinfection, and the management of the disease in

public institutions. But when we come to the consideration of the medicinal treatment of the affection, we confess to a degree of astonishment. Believing it to be impossible to abort the disease, and that there is no specific for it, the author attacks it in a spiritless manner. For the treatment of the paroxysmal stage he seems to place his whole reliance on belladonna. Certainly many and excellent authorities have reported good results with the local treatment of the disorder, and the home and foreign journals have been filled with the praises of antipyrin, to whose great value in this affection we can personally testify. Yet the subject of spraying the fauces is concluded in two lines; and of antipyrin the author merely says, "The latest favorite as a specific appears to be antipyrin, given in small doses in a little syrup."

A. D. Blackader contributes a good article on Variola. The author believes that some special micrococcus is the etiological factor, describes the pathological anatomy of the affection, and takes up the consideration of the symptoms. Attention is called to the more frequent occurrence in children of the initial rashes, and the nature of these is discussed. The course of the disease is then followed in its different forms, and the complications considered. The importance of an early diagnosis is referred to, the differences between this disease and measles being chiefly brought to view. We could wish that the diagnosis of the affection from chicken-pox had been treated a little more in full, since the difficulty in distinguishing the two is certainly very great at times. A largely expectant method of treatment is advised, excepting as regards the prevention of pitting, for which the author describes a large number of the plans proposed, none of which are, in his opinion, of any great value.

W. T. Plant, writing on Vaccination, describes in an interesting style the first introduction of inoculation, and the history of Jenner's discovery. He assumes that vaccinia is only modified smallpox,—we need hardly say, a very greatly disputed point. He rather prefers the humanized lymph, though admitting that syphilis has without question been transmitted by its use. He denies that humanized lymph gradually degenerates by passing through many individuals. The forms

of lymph are described, with their selection and preservation, the method of operation, and the course of the eruption. He claims that insusceptibility to the infection of cow-pox is very infrequent, if, indeed, it ever occurs.

A thoroughly good article is that of Charles G. Jennings on Varicella. The history of the disorder is given, and a series of reasons formulated why it should be considered distinct from variola. We are glad to observe that the author admits the possibility of it attacking adults, though stating that this is exceedingly rare. The claim so frequently made in the text-books, that the affection is never seen except in children, is not, we feel sure, borne out by facts. Symptomatology is next considered, a short space allotted to varicella gangrenosa, and the sequelæ then discussed. The author remarks the possibility of nephritis occurring as one of these. Particular attention is paid to the diagnosis of the affection from variola.

Oliver P. Rex contributes a short article on Parotitis, but appears to cover the ground. He discusses both the idiopathic and the secondary forms.

The next article is that on Erysipelas, by J. O. Hirschfelder, who describes the discovery of the specific micrococci by Fehleisen, and the inoculation experiments which have been performed. Then taking up in order the influence of sex, age, and season, he reaches symptomatology. The pathological anatomy is treated briefly, but as fully as is necessary, the author describing the conflict between the micrococci and the leucocytes at the seat of inflammation. The section on therapeutics includes all the more important plans of treatment, both old and new, and is very satisfactory.

W. B. Cheadle's article on Rheumatism in Children is a masterly contribution to this subject. After calling attention to the various phases of the rheumatic manifestation peculiar to children, he discusses its etiology at considerable length. He presents statistics and details cases to establish the predisposing influence of heredity, and makes remarks on that of temperament, age, and sex. He believes that the disease is more frequent in childhood than is usually supposed. The section on symptomatology is especially full, and is accompanied

by numerous reports of cases occurring in the author's experience. He makes some very interesting statements regarding the differences in the symptoms in children and in adults. He believes that chorea is not necessarily associated with rheumatism, but that in a very large proportion of cases there is such an association. This relation he discusses at some length, and details quite a number of cases illustrative of the various combinations and various order of succession in which the different manifestations of rheumatism may appear. The section on diagnosis is very interesting. In his remarks on prognosis he states that it must always be borne in mind that the danger is not over with the subsidence of the primary attack, for the heart affection is very liable in children to go on smouldering in a subacute form. The remarks on treatment are particularly useful, as tending to show by numerous statistics the actual comparative value of the different drugs recommended, and their influence in the prevention of endocarditis. Separate short sections are allotted to Chronic Rheumatism and to Rheumatoid Arthritis; both of which the author states to be rare in children.

F. Forchheimer, in his article on Malaria, opens with a severe and most just condemnation of the prevalent disposition to make this title "a charitable mantle to cover sins in diagnosis." He discusses etiology fully, detailing the early and recent researches in this department. The history of the plasmodium is given; with several illustrations. Remarks are made on the relation of the disease to temperature and moisture, and on its morbidity and pathological anatomy. Under "symptomatology" intermittent fever first is described at length. The author dwells on the necessity of examining the blood in cases difficult of diagnosis. The manifestations of the disease in the different systems of the body are treated of with great thoroughness and with especial reference to children. Remittent fever is then considered, and the difficulty of distinguishing it from typhoid fever mentioned. Chronic malaria and the malarial cachexia next engage his attention; prognosis receives a few words, and treatment is described at length. The whole paper is a valuable one, and cannot but increase the author's already wide-spread reputation.

Perhaps no one is better qualified to contribute the article on Yellow Fever than is John Guitéras. He states that the occurrence of the affection in children has been persistently denied by the native physicians; but he gives various statistical tables and charts which show that it does indeed occur, though often unrecognized. That it at times appears to break out sporadically among adults is due to the fact that it has in reality persisted all the time, undetected, among the native children. He describes the pathological changes found, quotes the negative results of Sternberg's bacteriological studies, and then reviews the symptoms. The diagnosis in children is often difficult, and he gives some space to its consideration. He decries the vigorous routine treatment often followed, and details the largely symptomatic plan of procedure which he believes suitable in childhood. His last remarks are on the prophylaxis of the disease.

William Wright Jaggard contributes a scientific article on Joined Twins. He discusses the hypotheses of fusion, fission, and radiation, as applied to their genesis; and gives a system of classification which is a modification of that originally proposed by Saint-Hilaire. Under this arrangement he describes *seriatim* the different varieties of monsters, with illustrations of many remarkable cases.

Horace Jayne, in a well-illustrated and clearly-written article, reviews the subject of Embryology. Describing first the structure of the ovary, he then explains the changes which take place in the ovum before fertilization, the structure of the testicle, and the development of the spermatozooids, the penetration of the latter into the ovum, and the subsequent changes which take place in this. The process is traced until the placenta is formed, and here the author leaves it. The subject is always a difficult one to those not making a special study of it, but the numerous illustrations have aided greatly in making it clear.

This necessarily brief review which we have here given is the result of a careful study of the volume. Nearly all the articles are good, most of them are excellent, and not a few are masterly. No work thus written conjointly by many collaborators can be equally good throughout; and while we have

criticised a few of the contributions, yet the volume is, as a whole, a most valuable addition to medical literature; one which no physician in active practice should be without, and one of which the editor may be justly proud. C. G.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Grawitz: Sudden Death in very Young Children. (*Rev. Mens. des Mal. de l'Enf.*, December, 1888.)

In this paper the author seeks to call the attention of medico-legal experts to a certain number of cases of sudden death in which children, who have all the appearances of good health, suddenly succumb with symptoms of asphyxia. Two cases are narrated in which death by asphyxia was probably attributable to considerable hypertrophy of the thymus gland. The first case was in an infant eight months old, who had always had good health, and was found dead in his bed one morning. At the autopsy it was observed that the thymus gland was unusually large. It covered the pericardium over most of its extent, and had a number of petechiæ upon it. Several small ecchymoses were also found upon the pericardium and the surface of the pleura. It is probable that the fatal asphyxia was caused by the compression of the thymus upon the large bronchi and the adjacent vessels.

The second case was an infant six months old, who had always appeared to be in good health. He was suddenly seized with dyspnœa, and died in a few minutes with symptoms of asphyxia. At the autopsy the thymus was found to be 7.5 centimetres long, 6 centimetres wide, and 1.8 centimetres thick. It nearly covered the pericardium. The other signs which are common in death from asphyxia—namely, multiple ecchymoses, lateral compression of the epiglottis, etc.—were very distinctly marked. Why death should have occurred so suddenly in these cases in the midst of blooming health is not easily explained. A. F. C.

Luzet: Do Relapses of Measles occur? (*Rev. Mens. des Mal. de l'Enf.*, January, 1889.)

Most of the infectious diseases confer immunity upon an individual who has suffered from one attack; but there are

exceptions to this pathological law. Recurrences of these diseases must not be confounded with relapses, by which is understood, new attacks, while the patient is still convalescent, or at least so near convalescent that it is improbable that immunity has ceased to exist. In measles either a recurrence or a relapse is a very rare occurrence. The cases in which there is a second attack of measles may be divided into several categories. One series collected by Thomas shows intervals between the first and second attacks ranging between three months and eighteen years. In other series the intervals were one to two days, three to four weeks, four to six weeks, six weeks, eight weeks, nine weeks, and one to two months. Most French writers either deny that there is such a thing as relapse in measles or else believe it is very rare. Valleix, however, has seen four relapses in one case, and others have seen recurrences which followed each other at very short intervals. In some of these cases it is not impossible that there may have been an error of diagnosis either in the first or in the second attack, especially at times during which epidemic roseola prevails. If the case is one in which the eruption is slightly anomalous, in which there is little or no catarrh, and in which the prodromal stage has been perceptibly shortened, it is probably measles, though there may be some doubt about it. For such doubtful cases among hospital patients there should be rooms completely isolated, in which they can remain until a certain diagnosis is reached, and such rooms should be rigorously disinfected after the removal of each patient.

A. F. C.

Starck : The Position of the Apex-Beat and Percussion of the Heart during Childhood. (*Rev. Mens. des Mal. de l'Enf.*, November, 1888.)

The author has made careful examinations with reference to this subject, upon three hundred children, between the ages of one month and fifteen years, determining as far as possible in each case the volume of the heart, its situation, its form, the development of the thorax, and the situation of the mammary gland. The following are his conclusions :

1. It is frequently impossible during the first years of life to determine with precision the exact point at which the apex of the heart strikes the chest wall.

2. In most cases the apex of the heart is located outside the mammillary line until the fourth year. In the subsequent years the distance which separates the apex from this line diminishes.

3. In rare cases the apex of the heart may be found upon

the mammillary line during the first year; and near the age of seven years this position becomes more and more frequent; after this period this position becomes exceptional again, though it is sometimes found as late as the fourteenth year.

4. The apex of the heart is never found within the mammillary line until about the age of two years; it is rarely found there until the seventh year; but after the ninth this situation becomes the rule, and after the thirteenth there is scarcely any exception to this rule.

5. During the first year the apex of the heart is almost always found in the fourth intercostal space; after that period this situation becomes exceptional.

6. It is unusual to find the apex of the heart in the fifth intercostal space during the first two years of life; this situation is a common one between the third and sixth years, and subsequently it is much less frequently found.

7. During the first years of life the apex of the heart is rarely found in the fifth intercostal space; after the seventh year this position is a common one, and it is almost constant after the thirteenth year.

8. During childhood the apex is exceptionally found in the sixth intercostal space.

With regard to percussion, there are great differences of opinion; the author's investigations led him to recognize during childhood three degrees of præcordial dulness,—the first corresponding, as a rule, to the first year of life, the second to the sixth year, and the third to the twelfth year.

A. F. C.

Pairman, T. Wyld: *The Treatment of Diphtheria in Children by Steam medicated with Sulphurous Acid.* (*Edinburgh Med. Jour.*, February, 1889.)

In this paper the author reports in detail six cases of diphtheria and refers to others. All but four of these were treated, and successfully, by continuous inhalation of steam combined with antiseptic fumes obtained by burning sulphur in the apartment. The patient is surrounded by an atmosphere of steam, retained by fixing to the bed an open umbrella and throwing over this a large sheet. A pipe conveys the steam from a boiling kettle into this tent. A teaspoonful of sulphur is burned in the room every hour.

Among other advantages in favor of this plan, the author gives the following:

Constitutional and local rest are obtained during the whole course of the disease.

The method is applicable in all forms of the disease, even in cases where the air-passages are much involved. The method is simple and but little apparatus is required.

Paralysis never seems to occur as a sequela, and convalescence is rapid.

No bad effects have followed where children have breathed steam four days and nights successively.

In the discussion following the reading of the paper, these points, among others, were brought out.

Steaming with antiseptics was not likely to be of much more value than simple steam. It must be remembered that epidemics vary so much that whatever mode of treatment was adopted it was sometimes successful.

It was regretted that the author had not made a more careful analysis as to the effect of steam alone and steam with sulphur fumes.

Eyre, J. J.: *An Outbreak of Measles at a Boys' School*. (*British Med. Jour.*, February 23, 1889.)

One of the masters in the boys' school at Claremont returned after a few weeks' absence on Monday, April 30. He felt poorly on Monday, and thought he was suffering from a severe cold; but became worse, and when first seen on Thursday, May 3, had the measles rash on his face and chest. He was last in contact with the boys on the evening of Wednesday; the school was closed Friday. He was in contact with twenty-nine boys, of whom fifteen had had measles; the remaining fourteen all took the disease. The time of contact was about thirty-six hours on May 1 and 2. The first boy was taken ill on May 9, the last boy on May 17. The time of incubation was, therefore, eight to sixteen days; the period, in the majority of the cases, being fourteen days. It proves that measles is an extremely contagious disease before the stage of eruption, as not one of the boys saw the master after the rash appeared.

Harnack: *Lime-Water*. (*Jahrb. f. Kinderh.*, xxix. 1.)

Lime-water has a greater value as a pharmaceutical preparation than has generally been recognized. It acts in part as an astringent. Everywhere where the free lime comes in contact with neutral fats, but especially from the small quantity of fat-acids, soaps are formed which overlay the tissue in the form of a soft greasy mass. It is probable that there is also a direct chemical action of the lime-water upon the albuminous elements of the tissue, for if it does not directly precipitate solutions of albumen, still the albumen is precipitated by

dilute muriatic acid if the albumen solution has been mixed with lime-water, and it is possible that the lime-water might gradually form insoluble compounds with the living albumen. The lime-water penetrating the tissues is precipitated in a very finely-divided condition in the presence of carbonic acid, and thereby forms a protecting layer about the cells of the surface of the tissue. The undoubted capability of lime-water to dissolve diphtheritic false membranes depends upon the fact that it is an excellent medium for dissolving mucin, which secures the false membranes to the surface of the mucous membrane and the particles of fibrin to each other. Lime-water may be used for solvent purposes either as a gargle or as a spray, for the atomized lime-water is immediately converted into carbonate of lime. The combined solvent and astringent effects of lime-water make it especially useful in the treatment of pharyngeal catarrh.

A. F. C.

II.—MEDICINE.

Moncorvo: *Asthma in Childhood and its Treatment*. (*Rev. Mens. des Mal. de l'Enf.*, January, 1889.)

The general opinion of authors previous to this century, and even in the first half of this, was that childhood had immunity from asthma. During the second half of this century, Hyde Salter, of London, has shown that of forty-seven cases of asthma between the ages of one and sixty years, which were seen by him, nineteen were in children under ten years of age. Trousseau, Guersant, Blache, Parrot, and Germain-Sée, in France; Loeschner, in Prague; Politzer, in Vienna; Charles West, Thorowgood, Berkast, Fuller, and William Day, in England; Austin Flint, in America, have all shown that asthma in children was a fact. The recent treatises on infantile pathology by Bouchut, Descroizilles, d'Espine, and Picot demonstrate the same fact. Since 1885, Moncorvo has seen forty-eight cases in children in Rio, and therefore believes that it occurs among them in that climate in a fair proportion of cases. Both sexes seem to be about equally susceptible, and the influence of heredity in the matter seems unquestionable. The causes of an attack of asthma may be occasional or predisposing, and the former are more or less dependent upon the latter. The predisposing causes may be of central origin, in which case the respiratory centre is directly attacked, or they may be of peripheral origin. In the latter case they act indirectly by the reflex action of excitations which operate upon the digestive or respiratory mucous membrane or upon

the skin. The predisposing causes are climatological, telluric, meteorological, or individual. With regard to the pathological physiology, Hyde Salter was the first, in 1860, to bring order out of the chaotic history of this disease by showing that asthma is essentially a disease of the nervous system, under the dependence of a central or peripheric irritation of the vagus, which produces contraction of the muscles of Reissessen. Bretonneau calls asthma pulmonary epilepsy. Recent writers attach importance to the spasm of the muscles of inspiration in asthma, and clinical observation seems to establish the correctness of this idea. The hypersecretion of the bronchial mucous membrane, which is also of nervous origin, must not be overlooked. The symptoms may be of two forms: the typical, which recalls the asthma of adults by the suddenness and some other characteristics of its manifestations, and the bronchial, which is characterized by attacks of dyspnoea occurring in the midst of catarrhal symptoms. Palliative treatment may be applied at the time of the attack, and curative in the intervals. Tincture of lobelia in large doses proves highly beneficial, also inhalations of pyridine, five drops being placed on a handkerchief three or four times daily. The iodine treatment has seemed to be efficient in permanent, even in very severe, cases.

A. F. C.

Jaksch: *The Clinical Evolution of the Pustules of Vaccinia.* (*Rev. Mens. des Mal. de l'Enf.*, November, 1888.)

This paper is based upon a careful study of the normal evolution of vaccinia in nineteen children. With reference to the fever the author's observations differed from those of Hennig and Bohn, for he found in almost no cases a rise of temperature during the first two days after vaccination. In several of his cases the temperature was subnormal during those days. It would seem to be established by the condition in all these cases that during the stage of incubation of vaccinia the temperature is most frequently a low one. Rise of temperature always occurs gradually, and the first febrile movement is perceptible between the forty-fifth and the one hundred and sixty-fourth hour after vaccination. At a little later period the temperature rises rather suddenly, the acme being usually reached within twenty-four hours. In the author's cases the fever varied between 38° and 40.5° C., and continued an average period of four to six days. It was remittent in most cases, and only disappeared after a period in which it was subnormal. It did not appear that there was any relation between the fever and the local inflammatory reaction; the acme of the fever did not always coincide with

the maximum of development of the pustules. The pulse was usually accelerated after vaccination, but this symptom seemed to be in relation with the fever which followed, rather than with any other influence. In most of the cases there was also a certain degree of acceleration of the respiration. During the entire course of the fever the urine continued normal in quantity and density. During the stage of incubation it frequently happened that the quantity of urine was increased and continued to be excessive until total defervescence occurred. In no case was albumen or acetone found in the urine. All these facts furnish an additional demonstration that the fever and the other general symptoms are not the result of the local inflammatory reaction which accompanies the development of the pustule of vaccinia, but that they are rather the expression of the particular infection which has involved the entire organism. In all these cases vaccination was performed either in the course of or subsequent to some disease which was more or less severe, which shows that vaccination signifies no danger to a child, no matter when performed.

A. F. C.

Cadet de Gassicourt: Paralytic Chorea. (*Jour. de Méd.*, October 28, 1888.)

Paralytic chorea is a form of the disease which is not very widely known, but deserves to be. Its peculiarity is that paralysis replaces inco-ordination of the movements more or less completely and for a longer or briefer period. It is not always easy of diagnosis. This disease has been described by the English under the term "limp chorea," which is expressive, and sufficiently exact for the severest cases of it. But it is not sufficiently comprehensive, for it does not include those cases in which the paralysis is less extensive, though complete in the parts which are involved. It is a rare disease, only two cases having come under the notice of the author, while Gowers, West, Dauchez, Charcot, Rockwell, and Ollive have reported, in all, fifteen. It was well described by Ollive in 1883 under the title "Paralyses in those who are suffering from Chorea." It is observed under three different aspects: (1) it is a consequence of the common form of chorea, inco-ordination of the movements being followed by paralysis; (2) it precedes ordinary chorea, paralysis being followed by inco-ordination; (3) paralysis may exist almost alone from the beginning to the end of the disease. Its localization may vary; it may assume the paraplegic form, as in Ollive's case; it may affect a single limb, as in Gowers's cases; it may take paraplegic form, as in Charcot's case. Whatever be the localization, the prognosis and

treatment are the same in all cases. The prognosis is favorable in all the reported cases; the result was a cure. The treatment should be tonic,—iron, quinquina, arsenic, sulphur baths, and hydrotherapy in general. A. F. C.

Geier: Nephritis and Albuminuria in the Typhoid Fever of Children. (*Jahrb. f. Kinderh.*, xxix. 1.)

During the seventh decade of this century, Gubler and Robin called attention to the existence of nephritis in connection with typhoid fever, and to a renal form of typhus fever. In 1881, Amat gave to the renal form of ileo-typhus a distinct clinical history. Weil and Homburger, however, endeavored to show that the renal form of typhoid fever as described by Amat was, to a certain extent, not distinctly proven, and Weil showed, furthermore, that nephritis in the early or even in the advanced stages of typhoid fever seldom led to great insufficiency of the kidneys, with dropsy and uræmia. The author, notwithstanding Weil's statements, has seen and published the histories of cases of typhoid fever which were complicated with typical acute parenchymatous nephritis and extensive dropsy. These cases were analyzed to see,—

1. Whether there is an influence in typhoid fever which tends to albuminuria; whether, in other words, one can speak, in typhoid fever, of a febrile albuminuria in the true sense of the word.

2. Whether the nervous symptoms in typhoid are dependent upon the fever, and whether a connection can be shown between them and the albuminuria.

3. Whether the treatment in typhoid fever exercises any influence upon the albuminuria.

As to the treatment in the author's cases, calomel was given at the beginning of the disease, if constipation were present; a fluid diet was used for the most part, solid food being given only when there had been an absence of fever for at least a week. The patients were bathed daily in cool water, or received a bath every second day, lasting ten to fifteen minutes, in water at a temperature of 35° C. Excitants were only given when there was heart-weakness. For headache, drowsiness, or delirium, an ice-bag was applied to the head, and in some cases to the abdomen also. The fever was treated,—

1. With baths at a temperature of 27° to 30° C., lasting fifteen minutes when the temperature exceeded 30.5° C. This treatment was not continued in cases in which symptoms of collapse occurred. In some cases the baths were given at a temperature of 32° to 34° C., and in others cold affusions were made to the head for its stimulating effect upon the sensorium.

2. With antipyretics, including quinine, antifebrin, and antipyrin.

3. With baths and antipyretics, a bath being given between eight in the morning and eight in the evening, as often as the temperature exceeded 39.5° C., while at night antipyretics were used for similar elevations of temperature.

4. In some cases nothing was done to act upon the fever.

Only one of the twenty-five patients in this series died, and in this one the nephritis was associated with a precedent scarlatina. The following conclusions were reached:

1. Albuminuria is a very common occurrence in the typhoid fever of childhood. It usually appears in the first or the beginning of the second week. Its duration varies, but it usually lasts one or two weeks.

2. Nephritis occurs in the typhoid fever of childhood just as it does in adults. The more intense conditions of this complication occur rather less frequently in children than in adults. There is no particular renal variety of typhoid fever in children.

3. Infectious diseases, like scarlatina, in which the kidneys are usually affected, appear to lead, in children, to the development of nephritis, when they are followed by typhoid fever.

4. Fever, albuminuria, and nervous symptoms in typhoid fever are the result of one and the same cause,—namely, the intoxication of the organism with the poison which is developed from the typhoid bacillus.

A. F. C.

Pins: The Relations of Scrofula, as a Whole, to Certain of its Symptoms. (*Arch. f. Kinderh.*, x. 2.)

The *résumé* of this subject leads the author to certain important conclusions. A large number of symptoms which are attributed to scrofula may be excluded from the symptomatology of this disease, because there are other sources for them, besides scrofula, with which they are much more frequently associated during childhood. In other words, rhinitis, otorrhœa, infiltration of the lymph-glands, and impetigo are not characteristic symptoms of scrofula, and, consequently, the presence of one or more of these disease phenomena, or even the simultaneous existence of all of them in an individual, does not completely justify the opinion that scrofula is present. With the exclusion of these groups of symptoms from the concept of scrofula, the number of children who have hitherto been included in the category of the scrofulous would be decidedly lessened, and the complaint of the great frequency of this disease during childhood would have to be modified. Since imperfect attention to a rhinitis, an otorrhœa, or a moist

eczema adds much to their duration, and introduces complications which may readily be assumed to belong to scrofula, it is readily conceded that this supposed scrofula is seen much more frequently among the poorer classes than among the well-to-do, where the possibility of obtaining careful medical attention is far greater and the regard for cleanliness is much more pronounced. The intimate connection of scrofula with tuberculosis, which has been announced by Rokitansky and others, and further demonstrated by the bacteriological investigation of Klebs, Villemain Cornil and Babes, and others, makes it probable that the statistics of scrofula will be collaborated with those of tuberculosis in different countries. The diagnosis of scrofula is, therefore, to be referred, in the first place, to the results of bacteriological examination, and is not to be determined upon clinically without the simultaneous presence of one or more of the severe symptoms, such as infiltration of the bronchial glands, fungous inflammation of the joints, caries of the skeleton, cold abscess, swelling of the liver or spleen, etc. If these symptoms are not clearly developed, we must clearly prove an hereditary taint before attributing to disease of the ear, lymph-glands, and mucous membrane a diagnosis of scrofula. In the treatment of the four diseased conditions which may simulate scrofula, local means should precede all others. As the local condition improves the facility of making a diagnosis will also improve.

A. F. C.

Sympson, E. Mansel: Congenital and Infantile Spastic Palsy. (*Practitioner*, February, 1889.)

The author reports four cases of this affection. The age of the patients ranged from nine to twenty-five years. One case had been paralyzed since birth, but the spasm and athetosis had come on since. Another case had convulsions when nine months old, since when he had suffered from left hemiplegia. The third case had convulsions soon after birth, followed by paraplegia which had persisted ever since. The fourth case had had right hemiplegia from birth, and had had convulsions from two and a half years of age to the eighth year. For the last year these had degenerated into petit mal. The author attempts to show that all spastic cerebral palsies own the same pathology. The locality of the lesion is almost certainly in the cortex cerebri. The following reasons, among others, are given: Irritation or partial destruction of the cortex in the motor areas would be attended by spasm. The intermittent activity of partially damaged cortical cells would give rise to epileptiform convulsions. The records of post-mortem investigation are in favor of cortical lesion.

As to causation, the author says that hemorrhage into the meninges will explain most of the cases satisfactorily. This may take place before or at birth; if fatal, soon the blood will be found effused; later on there will be atrophy of the convolutions involved. The author's reasons for the theory of meningeal hemorrhage are as follows: Fatty degeneration of cerebral vessels is common in cachectic children. Many cases date the origin of palsy from acute eruptive fevers or acute general diseases. These are supposed to exert injurious action on the walls of blood-vessels. Again, the brain and meninges are developing most rapidly in infancy, and this may explain why the blood-vessels rupture there. The author believes in the cerebral origin of most, if not all, of the cases of congenital or infantile spastic paraplegia, and not in the theory that it is a spinal disease.

Finlayson, James: Tumor of the Brain in a Child. (*Glasgow Med. Jour.*, January, 1889.)

The tumor involved all three lobes of the cerebellum. There was some adhesion of the dura over the left lateral aspect of the cerebellum. The ventricles of the brain were much distended with fluid. There was no tubercular meningitis. The superior longitudinal sinus was occupied by a thrombus in its whole length. At the root of the right lung an abscess cavity was found communicating with a large bronchus having sacculated dilatations full of creamy pus. A caseous nodule was found in the left kidney.

The patient was a boy aged four years. The duration of the entire illness was about one and a half years.

The principal symptoms, marked by gradual development, were headache, vomiting, inability to walk, drawling speech, nystagmus, strabismus, and neuro-retinitis. The mental state was dull. Incontinence of urine occasionally occurred. Power of deglutition was lost towards the end.

Sweatings of the right side of the head of a very definitely unilateral character were present in the last few weeks.

Percussion of the skull was practical, and the sound elicited had that curious character suggestive of a cracked vessel, or giving the idea of the bones at the sutures rattling against each other.

Towards the end of the case the head became much enlarged.

The author found no difficulty in making a diagnosis, but the localization of the tumor seemed too uncertain to him to pronounce an opinion on it. The bilateral symptoms, site of the pain, the great unsteadiness, and ocular symptoms suggested the cerebellum.

Dr. Joseph Coats prepared the pathological account of the tumor, and the details are given in the original article.

Anderson, J. Wallace: *Anomalous Forms of Measles and Scarlet Fever.* (*Glasgow Med. Jour.*, January, 1889.)

The author reports two cases of measles without catarrh, and with a rash peculiar in its appearance, in its time of appearing, and in its sequence. The eruption consisted of a few faint spots,—not blotches. The eruption appeared from the seventh to the tenth day. There were no sequelæ. These cases were undoubtedly measles, for other children in the same family had measles in the ordinary form either just before or afterwards.

The peculiarity in the case of scarlet fever was that it was without fever, without rash, and without throat symptoms, as far as could be made out. The boy was in such a state of collapse that it seemed more like a case of acute irritant poisoning. He died in forty-eight hours from the onset.

The history and desquamation in two other children, and the unmistakable form occurring later in another child in the same family, made the diagnosis of malignant scarlet fever certain.

In the discussion following the report of these cases the point was raised,—whether these mild forms of zymotic diseases were as protective as if they had shown the typical symptoms. The weight of opinion was in favor of the view that these mild attacks did not protect efficiently.

Von Dusch: *Croupous or Fibrinous Pneumonia with Especial Reference to its Occurrence in Children.* (*Jahrb. f. Kinderh.*, xxviii. 3 and 4.)

The author's analyses include cases seen at the Heidelberg hospital among the lower classes during the period between 1857 and 1885. Among children it was most frequent between the ages of three and seven years. The work of Klebs, Friedländer, and others have made it almost certain that pneumonia is due to the invasion of a microbe, probably the coccus of Friedländer, and should be classed among the infectious diseases. The infectious element probably gains entrance into the body by way of the respiratory organs. Like the other infectious diseases, croupous pneumonia is characterized by a typical febrile course; like them, also, its presence in particular epidemics and in particular individuals is marked by great variations as to intensity and danger to life. Of the six hundred and thirty cases which were seen during the period which has been referred to, fifty-seven, or 9.04 per cent., were fatal.

The author describes the various ways in which croupous pneumonia in children may begin its possible coincidence with broncho-pneumonia, the central and peripheral forms, and the difficulties of diagnosis in the former variety and in cases in which the catarrhal and the croupous processes are combined. With regard to treatment, there is no so-called specific for this disease, and the best that one can do is to keep the patient in the best possible condition, and treat threatening symptoms as they arise. The dangerous element of the disease probably does not consist in the fever, but in the virus of the disease itself, which may be overpowering. The author believes that the less active the treatment the better will be the results, and, working upon this plan, his statistics during recent years have been better than when he used large doses of powerful drugs.

A. F. C.

III.—SURGERY.

Dixon Jones: *The Etiology, Pathology, and Operative Treatment of Rhachitic Deformity, as based upon One Hundred and Fifty-eight Consecutive Osteotomies, without Suppuration.* (*Annals of Surgery*, April, 1889.)

The author commences his article with an historical sketch, in which he shows the antiquity of rhachitis and its great prevalence among all classes. He discusses the etiology from two points, the predisposing and direct causes. Among the predisposing causes are abnormally large arteries, so that the normal proportion of the blood-vessels to the heart is greatly changed, and as a consequence the blood-pressure is lowered. This change in the vessels corresponds to the time when the rhachitic process is most marked. This retarded circulation explains the murmur over the fontanelles, the flabbiness of the muscular tissues, and the swelling and softening of the epiphyses. The large size of the liver and the smallness of the lungs aid materially in retarding the circulation; and these factors, with the watery condition of the blood, give rise to the catarrhs of the pharynx, larynx, and respiratory organs with which rhachitic subjects are so generally affected.

The author gives the views of many writers who claim a congenital origin for these arterial changes, but states, from his own observations, a disbelief in any hereditary tendency, at all events, as an essential condition.

He discusses very fully the subject of nutrition, claiming that where there is no other element, and everything else is favorable, improper feeding will produce the disease, and of

all the artificial foods the farinaceous are most frequently associated with a rickety constitution.

The author describes normal ossification, and compares it with ossification in rhachitis; in the latter the preparatory process goes on at a more rapid rate, but the formation of new bone from the medullary tissue is very scanty or entirely absent, the blood-vessels are increased, so that the cartilage becomes more vascular, the bone corpuscles are increased, the lime salts diminished, and the bone generally remains in a stage of cancellous structure with large irregular spaces. He does not believe that the deformities of the bones are due to muscular action, but to external causes.

Regarding the surgical treatment, the author urges the early recognition and correction of bow-leg and knock-knee deformities: while the bones are still soft orthopedic apparatus may be of service, but after hardening has commenced it is worthless. He does not believe in leaving the cases to nature, hoping for an improvement as the health and nutrition are improved, but rather the obtaining of judicious surgical interference.

After alluding to the various instruments that have been employed for the performance of osteotomy, the author gives his preference to Macewen's osteotome. The operation may be either linear or cuneiform. A section of bone in linear osteotomy is made through a small wound just large enough to admit the osteotome. Leave the bistoury in the wound as a guide to the osteotome. When the latter reaches the bone it is turned to the direction that the osseous incision is to be made. Avoid wounding blood-vessels with the bistoury, and direct the osteotome away from important structures. Drive the osteotome through the bone by pretty firm blows of the mallet, and after each blow move the instrument from side to side to prevent it from getting wedged in the bone. The author uses a good-sized carpenter's mallet, and, in dividing large bones, osteotomes of two or three sizes, commencing the section with the largest.

In performing cuneiform osteotomy a large open wound must be made, and the operation is not subcutaneous. In either, strict antiseptic precautions must be used; also profound narcotism to prevent movement of the limb from muscular contraction; and an Esmarch bandage applied to render the limb bloodless. When the section of the bone is nearly completed the osteotome is withdrawn, and the deformity rectified by fracturing with the hands the remaining bridge of bone. Then, having thoroughly irrigated the wound, a wet sponge is applied and covered by a roller bandage, and the

Esmarch bandage removed. As a rule, the hemorrhage is very slight. After circulation has become established, all bleeding vessels are ligatured, the edges of the periosteum are united with catgut sutures, a few strands of catgut placed at the angles of the wound for drainage, and the skin united, iodoform is dusted over the wound and covered with a strip of Lister's protective, and the whole limb enveloped in sublimate gauze and absorbent cotton and neatly bandaged. After the limb is dressed a plaster bandage is applied, and the author prefers to suspend the limb perpendicularly instead of allowing it to lie horizontally. At the end of three weeks remove the dressings, correct any deformity, and re-dress for another three weeks.

The author concludes his paper with the abbreviated reports of twenty-seven cases, and wood-cuts of some of the worst both before and after operation.

Judson, A. B.: *The Question of Interfering with the Abscesses of Hip-Disease.* (*Med. Jour.*, March 2, 1889.)

Two cases of hip-disease were shown in which abscesses had been absorbed. Such cases are illustrations of the advantages which sometimes attend withholding the knife. Although, as a rule, the fluctuating tumors of hip-disease are followed by purulent eruption, the writer has seen a number of cases of hip-disease and Pott's disease of the spine in which abscesses have disappeared with most favorable results. It may be supposed that the water which makes up the bulk of these gatherings is absorbed without difficulty, while the residuum coalesces with the cellular tissue, leaving in some cases subcutaneous bands of cicatricial tissue, which derange the orderly relations of the normal connective structures. It is not clear why some abscesses are thus absorbed, while others approach the surface, perforate the skin, and are evacuated, any more than it is clear why some cases of joint-disease are attended with, while others are free from, abscesses. We may, perhaps, look for the reason of this diversity in the individual diathesis rather than in the local peculiarities or accidents of a given case. The writer has no desire to wilfully oppose accepted views, but is impelled by the favorable results of experience to state that his practice in these difficult cases is: 1, to give the bone and joint the most absolute mechanical rest possible; 2, to insist on the most liberal and varied diet, of which, as a rule, milk in unlimited quantities is the staple; and 3, to permit the use of opium, which, if used, is to be given in potent doses.

His reasons for failing to see the importance of incision, scraping, and antiseptic closure of the abscesses in question are: Incision is a tardy and fruitless procedure. The most painful stage in the history of the abscess is long past. If we could interfere early with the bistoury and know where to direct its point, we might relieve the pain, and perhaps, in favorable circumstances, shorten the case and save bony tissue by dividing the thickened periosteum or breaking the sheet of compact bone. But when the pus is in the cellular structures or the cavity of the joint, he does not see that the progress of the case can be materially affected by interference. If the abscess is cold, there is no painful tension to be relieved. If it is phlegmonous, tension is the result of inflammatory infiltration, and can be relieved only by extensive and multiple incisions. If we operate in either case we substitute artificial for natural closure, and with the best antiseptics we gain nothing by operating unless we reach and scrape out the purulent dépôt or the interior of the joint, and then nothing unless we remove the eroded cartilage and exfoliating bone and excavate the focus, and then nothing in many cases unless we remove large quantities of bone or excise the joint. And if we operate in the manner described we do not avoid the necessity of bringing to bear the best mechanical treatment and hygienic control, which, if they are supplied, will bring about recovery, whether we operate or not, by the slow but sure process of natural repair, with the better result the less we interfere with the soft parts, as a general rule.

PROGRAMME OF THE SECTION ON DISEASES
OF CHILDREN, AMERICAN MEDICAL ASSO-
CIATION, NEWPORT, RHODE ISLAND, JUNE
25-28, 1889.

First Day.

1. "The Management of Infants during the First Year."
By T. B. Greenley, West Point, Kentucky.
2. "Cow's Milk for Infants' Food." By E. F. Brush,
Mt. Vernon, New York.
3. "Summer Diarrhoea and Dysentery." By N. Gulman,
St. Louis, Missouri.
4. "Intestinal Diseases of Children during Hot Weather."
By Peter Hooper, Philadelphia, Pennsylvania.
5. "Cholera Infantum: its Etiology and Treatment." By
Steele Bailey, Stanford, Kentucky.

Second Day.

1. "Heart-Failure in Diphtheria." By George Wheeler Jones, Danville, Ohio.

2. "Intubation of the Larynx, with Reports of Cases." By F. E. Waxham, Chicago, Illinois.

3. "Scarlatina." By C. R. Earley, Ridgway, Pennsylvania.

4. "Pathology and Treatment of Certain Complications of Scarlatina." By Talbot Jones, St. Paul, Minnesota.

5. "Hydrogen Dioxide in the Treatment of Diseases of Children." By M. P. Hatfield, Chicago, Illinois.

6. "A Rule with Penalty in Public Schools." By David S. Booth, Sparta, Illinois.

7. "Poliomyelitis Anterioris Acuta." By S. P. Deahofe, Potsdam, Ohio.

Third Day.

1. "Serious Abdominal Injuries of Children resulting from Traumatisms seemingly Trivial." By I. N. Love, St. Louis, Missouri.

2. "Visceral Neuralgias in Children." By J. C. Wilson, Philadelphia, Pennsylvania.

3. "Atropine in Enuresis." By William Perry Watson, Jersey City, New Jersey.

4. "Adherent Præputium Clitoridis as a Cause of Chorea in Girls, with the Report of a Case." By C. Henri Leonard, Detroit, Michigan.

5. "A Further Study of the Cardiac Relations of Chorea." By William Osler, Baltimore, Maryland.

6. "The Treatment of Heart-Diseases in Children." By J. A. Robison, Chicago, Illinois.

Fourth Day.

1. "The Physical Education of Children." By A. H. P. Leuf, Philadelphia, Pennsylvania.

2. "The Treatment of Tubercular Bone Lesions before the Joint is Invaded." By V. P. Gibney, New York.

3. "Notes on Surgical Diseases in Children." By Edw. Borek, St Louis, Missouri.

4. "Spina Bifida." By Norman Teal, Kendallville, Indiana.

5. "Trismus Nascentium." By A. V. Williams, Frankfort, Kentucky.

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Original Communications.

THERAPEUTICS OF INFANCY AND CHILD- HOOD.

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Diseases of Children in the College of Physicians and Surgeons, New York, etc.

(Continued from June Number.)

V.—INFECTIOUS DISEASES.

14. *Pertussis.*

THE mortality from pertussis in New York City is as great as that from typhoid fever. Twenty-five per cent. of all the cases under a year terminate fatally; five per cent. of all those between the first and fifth year, and one per cent. of all those occurring after the fifth. Its mortality, however, is not the only danger, for not infrequently chronic laryngitis, pneumonia, emphysema, and the result of hemorrhages taking place during the attacks, impair the health of the patient for many years or a lifetime. Thus the tendency of allowing whooping-cough to run its full course on the plea that it is a self-limited disease, or that every child must have its whooping-cough, is certainly not justified.

The prevention of whooping-cough, which is a specific and contagious disease, is certainly not easy, for the reason that contagion may take place very suddenly, and through the first

and second stages of the disease, both of which extend over a large number of weeks. Contagion may take place, no matter whether the cause is to be looked for in the presence of micro-organisms or not, by means of the exhaled air, or mucus, or the masses brought up by vomiting. Prevention means protection against the effects of all these factors.

As the disease is spread by contagion only, isolation is an absolute necessity, difficult though it be. In public institutions it is impossible. Thus no patient ought to be admitted to, or allowed to remain in, a public school. Whooping-cough children must not even be permitted to congregate in large numbers, because the cases will become more severe by their mutually affecting each other. In one point only isolation is more effective in whooping-cough than in other contagious diseases,—namely, in this, that the disease does not appear to be carried by persons not thus affected.

The air must be kept pure, uniform, and moderately warm. No wind or draft, however, must be permitted. Utensils must be kept clean and be disinfected, and the masses brought up by vomiting disinfected, destroyed, or removed. The mucous membranes must be kept in, or restored to, a healthy condition, particularly those of the mouth and respiratory organs. Thus no injudicious exposure must be allowed. The digestive organs have to be watched, the stomach must not be full at any time, the bowels kept regular, the food be digestible.

As long as the cause of the disease is not understood, and therefore no causal indication can be fulfilled, the object of treatment limits itself to this: to relieve the severity and diminish the number of the attacks, to procure quiet nights, to stop the vomiting, to shorten the course of the disease, and to prevent detrimental consequences.

An important indication is that of treating a catarrhal or inflamed mucous membrane. It is quite possible that a sore mucous membrane only is capable of admitting the contagion of whooping-cough as it does that of other infectious diseases, for instance, diphtheria. Besides, by attending to the mucous membranes in time, the occurrence of serious complications, such as pneumonia, may be prevented. Catarrh of the mouth

and pharynx ought to be treated with doses of chlorate of potassium of from half a grain to a grain in a teaspoonful of water every hour; and a large number of our expectorants find their ready indications in such cases. All of those which have a depressing effect must be avoided, particularly anti-moniais. Even ipecac must be given in small doses only. Alkaline waters have a beneficial effect. The muriate of ammonia in doses of from half a grain to two grains every hour or two hours will liquefy the viscid secretion of the bronchial mucous membrane. In a state of evaporation, as described in a former essay, it may be inhaled. The inhalation of other agents, which have been recommended as expectorants, will at the same time act as germicides, so the vapors of benzol, of carbolic acid, and cresolin; and the reputation obtained by gas-works in the treatment of whooping-cough is thus finding its ready explanation.

The effect attributed to astringents in the treatment of whooping-cough is best explained by their action on the mucous membranes. Particularly alum and tannin have been so employed. Emetics have been recommended for the purpose of relieving the surfaces of sticky mucus difficult to remove. Sulphate of copper or zinc, ipecac powdered, or turpeth mineral are the proper substances to be selected for that purpose.

Schliep has seen good effects of the use of the pneumatic chamber in whooping-cough. He kept the children with their mothers or attendants in compressed air. In a few cases a few sessions of two hours each were sufficient to relieve the patients considerably. In a number of cases from twelve to twenty sessions were required. In all of them he claims decided effects, not only in the reduction of the number and severity of the attacks, but also in the duration of the disease. The explanation of the good effect is looked for as well in the increased amount of oxygen inhaled as in the diminution of the hyperæmia of the mucous membrane. I believe the plan is a good one, particularly if it could be combined with the inhalation of turpentine.

Cases exhibiting a severe degree of pharyngitis and laryngeal hyperæmia, particularly in children who have suffered a long time from chronic inflammatory affections of the parts, will

do well, as far as the local symptoms are concerned, under the use of the tincture of *pimpinella saxifraga*; a drachm distributed over the twenty-four hours will be the proper dose for a child of from two to three years.

Local treatment has been resorted to by many. The pharynx has been treated locally with a solution of quinia (Hagenbach), a two-per-cent. solution of resorcin (Moncorvo), a one- or two-per-cent. solution of nitrate of silver, a five-per-cent. solution of hydrochlorate of cocaine, of four- or six-per-cent. solution of bromide of potassium. Applications have also been made directly to the larynx of quinia mixed with bicarbonate of sodium in different proportions, of mild solutions of salicylic acid, and of powdered sulphur. Inhalations have been resorted to, besides those enumerated above, of sulphurous acid, and extolled as highly as any of those which have been mentioned. If they prove anything, they and the great number of the remedies recommended for the same purpose speak for the difficulty encountered in the treatment of whooping-cough, and for the confidence of the practitioner in the patience and submission of his wards. Michael treats whooping-cough as a neurosis, with the same means he employs against other neuroses attributable or attributed to nasal irritation. He claims that seventy-five per cent. of his cases of whooping-cough have done well when exposed to the influence of quinia, bromide of potassium, benzol, tannin, boracic acid, salicylic acid, iodoform, cocaine, bicarbonate of sodium, or prepared chalk applied to the mucous membrane of the nares.

The internal administration of chloral hydrate, or croton chloral hydrate, has been recommended by Lorey in 1879. The daily doses range from eight to fifteen grains. In all cases the attacks became less severe within a short time, but the disease itself was not shortened. Kennedy expresses himself very enthusiastically about the effect of the remedy, which is given by itself or combined with the bromide of potassium. To procure an occasional good night, a single dose of from six to twelve grains has rendered me good service.

The inhalation of chloroform, or, according to some, of ether, can be recommended in those cases in which convulsions

have either occurred during severe attacks, or in which the interruption of the circulation is such that cerebral hemorrhage or convulsions must be feared. In the case of a very young infant I have administered chloroform once every hour for every new attack during the course of a number of days in succession for that very purpose, with beneficial result.

Quinia has been used both internally and externally by a number of authors of good repute. It was first recommended by Letzerich, who claimed to have found the cause of whooping-cough to consist in the presence of a coccus which he intended to destroy by the action of quinia. That coccus has not been found to this very day, but still quinia has found favor for a number of reasons. Rossbach credits the drug with the power of relieving increased reflex irritability. Binz, however, attributes to it an antizymotic action. He gives as many decigrammes daily as the child has years, so a child of five years would take eight grains of quinia a day. He expects to find an improvement after two or three days, inasmuch as the attacks are said to become by that time shorter and less severe. Where it cannot be given internally, he administers it in suppositories or in injections. Where the sulphate or hydrochlorate are not tolerated, the neutral tannate of quinia is selected instead, with this proviso, however, that the latter salt is much weaker than the former, and has to be administered in doses from two to three times as large. It has the advantage of being tasteless. In our own country it is particularly Forchheimer, who reported ninety-seven cases as having been benefited by the administration of quinia.

Antipyrin has been recommended for whooping-cough, since 1886, by Demuth, Sonnenberger, Moncorvo, Guaita Wendt, and many others, as almost a specific. Like all the other chemical relatives of chinolin, it destroys parasites outside the organism. It has been claimed, or presumed; that it displays the same effect in it. Whether that is true remains to be seen. At all events, however, it is a powerful nervinum. It is claimed that it can be given with the same beneficial result in the beginning of the disease and in its most severe stage, and that the latter will terminate favorably in from four to five weeks after the beginning of the treatment. The

dose is from a grain and a half to two grains three or four times a day for every year of the patient, with an occasional large dose for the night.

Of all the medicines advised against whooping-cough I prize belladonna most highly. I have always returned to it after having discontinued it for the purpose of trying one after the other of the many remedies recommended during these thirty years. As early as 1861 I had occasion to express, in the *American Medical Monthly*, the following opinion :

“Belladonna is the most powerful remedy in whooping-cough. I scarcely remember a single case in which its administration, for years past, proved unsuccessful in shortening the duration of the process. The result obtained by me has generally been this : that a well-developed case of whooping-cough, after the diagnosis was made certain beyond a doubt, would last for only three or five weeks longer, instead of running through its full course of months and quarters of a year. The effect is generally not a sudden one. Many cases in which belladonna is given from the first commencement will become worse for a short while, then remain at their height for some days or a week, and gradually improve in both the character and frequency of the attacks. In others the effect is perceptible from the days after their first administration ; the cases soon assuming a more favorable aspect. Such has been my uniform experience during the last five years, in each of which the children of this city have been suffering from a more or less severe epidemic.

“My readers, many of whom doubtless have been in the habit of prescribing belladonna in whooping-cough with more or less marked success, need hardly be assured that I claim no priority. Belladonna has been recommended in this disease for many decennia, and has just as long been objected to, as either useless or dangerous. I have touched upon the subject because of my conviction that both the former objection and the latter fear are groundless.

“Belladonna is well known readily to produce symptoms of poisoning. An amount of two and a half or three grains taken by an adult in the course of a day, of either root or extract, has the effect of dilating the pupils, causing a feeling

of dryness in the throat, scintillation and giddiness, and even erythema of the skin. This latter effect is, however, not frequently seen in adults, while the effects on the pupil and brain are very common. It was therefore believed that, as nervous disorders are as common as they are dangerous in infantile age, these effects ought to counter-indicate its use; it was stated that it would cause congestion, sopor, acute hydrocephalus, and idiocy; and the practical consequence simply was that the dose of the remedy, when given at all in a case where it appeared to be indicated, was entirely too small. Thus, doses of a sixtieth, a forty-eighth, a thirtieth of a grain of extract of belladonna, repeated three or four times a day, were deemed sufficient and proper. These doses could not but prove unsatisfactory, and thus it happened that the remedy was misappreciated and given up. The doses, however, administered by me proved successful, because they were really sufficient.

“Infants of six or eight months of age affected with whooping-cough require a sixth of a grain of either the root or the alcoholic extract three times a day; children of three or four years tolerate three doses, each of half a grain. These doses appear to be very large in proportion to those tolerated by adults, but it is a fact which can easily be verified, that the effect of belladonna on the pupil and brain will hardly ever be perceptible in children from these or smaller doses. The succession of belladonna symptoms in children differs, moreover, altogether from that in adults; the erythematous and flushed appearance of the face and neck, sometimes even of the whole surface, is the first symptom in infantile age; whereas it is seldom observed in adults, or in cases of thorough poisoning only. Some of the old authors have advised the administration of belladonna to such an extent as to produce the first symptoms of poisoning; others, however, have insisted on this practice being dangerous and wholly objectionable. I, for my part, soon found that those children suffering from whooping-cough who exhibited general erythema from an apparent overdose recovered soon, while others, in whom no such symptom was observed, remained sick for a long time; and continued experience has proved that the occurrence of

this symptom is absolutely necessary for the full remedial effect. To obtain a cure in whooping-cough, the remedy must be given in a dose sufficient to produce erythema, or at least a flushed condition of the face, and, as it were, feverish appearance after every dose of belladonna. Thus the dose is to be gradually increased until this result is obtained. It is a remarkable fact that very young infants may take proportionately large doses: at all events, I do not remember a single case in which less than half a grain was taken in the course of a day. The prescriptions I have been in the habit of ordering are very simple ones. I either give the medicament as a powder, or have the extract dissolved and sweetened according to circumstances.

“The administration of belladonna alone is indicated in such cases of whooping-cough as are not complicated with inflammatory affections of the respiratory organs. The latter take the lead in complicated cases as well in treatment as in the nature and gravity of the symptoms. This is so certain that, whenever a pneumonia coincides with or follows whooping-cough, the peculiar sound of the cough of the latter will disappear, nor return before the inflammatory affection is removed. As this is, moreover, the most dangerous of the two, it requires attention before the other. As to bronchial and laryngeal catarrh, the former especially is a very common symptom in whooping-cough. Where it is but slight it may be considered as unimportant; where, however, it gives rise to fever or dyspnoea, it constitutes a further indication to interfere.”

The preparations mentioned above need not be the only ones to be relied on. The tincture of belladonna is a convenient remedy, inasmuch as the dose can be readily and gradually increased. A baby of two years may take three daily doses, the first of which may be six drops. If the flush be perceptible within twenty or thirty minutes, that is the dose; if not, the number of doses must be increased to obtain the effect which must be obtained after every dose. After a few days larger doses are required; there is no case but demands at least twice the amount of the original dose of belladonna within ten or twelve days, or before the disease disappears.

Atropiæ sulphas may take the place of belladonna. A child of two years will probably begin with the five-hundredth part of a grain, to be given three times daily, and increased according to the rules stated before.

Since that early time alluded to, Vogel speaks highly of the effect of belladonna, taking the dilatation of the pupils as a guide. As I have mentioned, this effect is rather late in appearing in children, and is not required; indeed, it may become quite uncomfortable. Meigs and Pepper combine belladonna and alum. Evans, in the *Glasgow Medical Journal* of 1880, recommends the administration of a large dose first, to be followed by smaller ones afterwards, and there are not a few authors who have seen immediate good effect following the intended or accidental administration of a large, almost poisonous, dose. Indeed, the number of practitioners now relying on the effect of belladonna in whooping-cough is quite large, no matter whether they look for the beneficial action on the laryngeal and other branches of the pneumogastric nerve or on the medulla oblongata, or rely on its influence in modifying reflex action.

Opium is spoken of favorably by a great many. I cannot recommend it for anything like regular administration, but it certainly has a good effect in procuring good nights when given in a single dose. A grain of Dover's powder given to a child of two years, at bedtime, will at all events have the effect of procuring sleep. In a number of cases the combination of opium and belladonna acts quite well. The antagonistic effect claimed for these two drugs is not such as to interfere with the combination of their effects as sedatives.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from June Number.)

VII.—STOMATITIS SYPHILITICA.

UPON the tongue there are found various lesions, some well known and thoroughly accepted as characteristic, others sufficiently characteristic as lesions but not as syphilitic lesions. Among those which are accepted by all are the various manifestations with which we have become acquainted in discussing the alterations upon the lips. The most common varieties found upon the tongue are: the plaques muqueuses and syphilitic ulcers. Both have infiltrated edges, but the plaques, in this situation, are raised above the level of the tongue while the ulcers are considerably depressed. Either one or the other form is characteristic and sufficient for a diagnosis of syphilis. Their localization depends somewhat upon the presence of an irritation, so that we find them opposite sharp teeth, but they may occur upon any part of the tongue without any especial cause being determinable.

There is no reason why the so-called primary sore could not develop upon the tongue of the child, and, certainly, such has occurred. As it would not differ from that in the adult, there is no especial interest attached to it. Children contracting syphilis from their nurses have the first manifestation either upon the lips or upon the tongue. When an ulcer which occupies a greater part or the whole of the tip of the tongue is present it is always suspicious, and when, in addition to the locality, a decided infiltration is present, the diagnosis is almost complete.

Among the manifestations upon the tongue which are frequently overlooked must be mentioned certain changes which go on in the epithelium. They are not characteristic of

syphilis, but they are usually present in the early period. They consist in a loss of epithelium which especially affects the mucous membrane, covering the filiform papillæ and the inter-papillary coating. As a result of this loss, the tongue takes upon itself a "shaven" appearance, it is redder and dryer than usual, and careful inspection reveals an absence of filiform papillæ with a corresponding prominence of the fungiform papillæ. The latter is only comparative, as these papillæ also have been deprived of their epithelium, but they seem to be more prominent because they are all that is left of the elevated formations of the tongue. When it is possible to get a view of the circumvallate papillæ they will be found to be very prominent and decidedly enlarged. In infants it is difficult to see the base of the tongue, but in older children it is very much easier than in adults, and in all cases of syphilis I have found these papillæ very much enlarged, so that in some instances my attention has been especially directed to them.

There exists a condition of the tongue which has been frequently described, but which has received especial attention comparatively recently, has been named, and been made characteristic for syphilis. This condition, called by Parrot (in "*Syphilis Héréditaire et le Rachitis*," 1886) *desquamative syphilide* of the tongue, is of great interest in all directions. Before going on to discuss its relation to syphilis and the evidences of such relation, it will be necessary to give a description of the condition. It is essentially a children's affection in the sense that it begins early in life: further observations will have to be recorded before we can decide whether it extends into adult life. I am now watching two cases in which the affection began twelve and thirteen years ago, and in neither case has the condition disappeared. I have also under my observation a young lady, now twenty-four years of age, in whom the process was first noticed when she was about five years old. The condition is not very common (fifteen cases in two thousand one hundred and ninety-seven sick children.—Parrot), but sufficiently so to enable every physician to see cases. A great many names have been employed to designate the affection: wandering rash (Berker), ringworm, the lichenoid condition (Gubler),

geographical tongue, and some have confounded this form of trouble with another psoriasis, tylosis, lichen or ichthyosis of the tongue. The latter are, however, affections to be distinctly separated from that which has been brought into prominence by Parrot.

The location of the disease is "almost invariably" the dorsum of the tongue, somewhere in front of the circumvallate papillæ (Butlin, "Diseases of the Tongue," p. 161). It begins at the edge or tip of the tongue in the form of a small patch which is characterized by a more opaque and whiter color than the rest of the mucous membrane. This patch is distinctly bounded by a greater or smaller part of the arc of a circle. The next step in the development consists in a simultaneous enlargement of the outline and a shedding of the epithelium within. The outline grows, in that the thickening of the epithelium extends, the circular line becoming greater, although usually developing upon the same radii which existed for the original patch. This outline depends upon the same pathological process as the first white, opaque spot,—viz., a too rapid formation of the epithelial cells which have not quite gone through the changes to become adult epithelium. As a result of this, these cells are heaped upon each other in greater number than normal, and, as a final result, they are more rapidly shed. The spot now assumes the appearance of a white or yellowish-white boundary surrounding a red surface. The red surface is characterized by a glossy appearance due to the covering of the mucous membrane by young and translucent epithelium, an entire loss of filiform papillæ, and a comparative prominence of the fungiform papillæ. By extension of the boundary and the simultaneous shedding of the epithelial layer the whole or a greater part of the tongue may become involved in one patch. According to Parrot the whole process is accomplished in from five to six days; this, however, does not agree with my own observation, according to which the period of time varies so greatly that I would hesitate very much to ascribe any exact length of time for the development of a spot with cessation of growth. According to Mr. Butlin (*loc. cit.*), "as the circles widen out, so may they contract again," from which we may infer that the epithelium

grows from the periphery towards the centre of the denuded spot. In the same sentence we find "but the rapidity of the subsidence is often so great that the surface of the tongue does not instantly regain its normal aspect."* The epithelium, according to my observation, forms all over the denuded spot, immediately the process of extension comes to an end, and the rest of the process, so well described by the author quoted, is due to the fact that the epithelial layer is formed as such, and no longer as young cells never destined to adult development.

Frequently two or more patches develop at the same time at different parts of the tongue. When this is the case one of them ceases to grow, while the other one seems to grow more rapidly, at least in the direction where they are contiguous. Again, it will occur that one or more new patches develop within an old outline; in such cases we see an undulatory, wavy appearance of outlines and slight elevations within the first boundary line. The course of the affection is that of a chronic disease. It may disappear for a time, so it is stated by all the authors, but relapses are common. In the cases which have come under my observation the tongue is never perfectly well, but there is always more or less evidence of this process, either in the form of an abnormal redness, the beginning of the development of a patch, or the presence of well-marked patches. I have taken occasion to watch the patients under my charge at times when they were otherwise perfectly well, but have always been able to see some change which would stamp the tongue as not perfectly natural. This disease either runs its own course and, after a greater or less time, leaves a normal tongue, or, as in the instances mentioned in the beginning, it lasts into adult life. How long into adult life the process may reach I am, at present, unable to state.

The pathological anatomy of the disease (Parrot) consists

* "As the circles widen out, so may they contract again, until each and every circle may disappear from the surface of the tongue; but the rapidity of the subsidence is often so great that the surface of the tongue does not instantly regain its normal aspect; it is slightly redder and smoother than natural."

simply in an irritative process or subacute inflammation, which goes on in the derma accompanied by the production of an abnormal epithelium, both quantitatively and qualitatively. Beyond this nothing distinctive can be obtained for this inflammation from Parrot's description, and he seems to have been the only one who has made microscopical examinations of tongues affected by this disease. The cause or causes of this affection are unknown to us. Parrot's view is the one which must occupy us here, as his reason for the syphilitic nature of the "wandering rash" is as follows: "J'ai pris au hasard dans mes notes 31 cas d'affection desquamative, et dans 28 les enfants portaient des marques incontestables de la syphilis héréditaire. Cela me suffit pour la caractériser, et je dis qu'elle constitue elle-même une manifestation syphilitique, et que la qualification de syphilide desquamative de la langue, que je propose, est suffisamment justifié" (p. 132, *loc. cit.*). ("Happazard, I have taken 31 cases of the desquamative affection from my notes, and in 28 the children showed incontestable signs of hereditary syphilis. This is sufficient to characterize it, and I say that it of itself constitutes a syphilitic manifestation, and the name which I propose, desquamative syphilide of the tongue, is justified sufficiently.") Again, on the next page he states that from the 1st of January to the 30th of April, 1881, two thousand one hundred and ninety seven children had entered the hospital. Of these, three hundred and twenty-eight had hereditary syphilis; out of the whole number of children, fifteen had the desquamative affection, of which thirteen belonged to the class in which there was no doubt of syphilis, one was doubtful, and the other showed no evidence of lues. As a *résumé* we would say that of the forty-six cases observed by Parrot, syphilis could be established by him in forty-one cases. The next thing to be taken into consideration is that Parrot was in the habit of considering manifestations as syphilitic which have not since been accepted as such. So that we may safely reduce the number forty-one somewhat. Let us grant, however, that all of the forty-one cases of the desquamative affection had syphilis, what reasons are given that the affection is a syphilitic one? None, except that the affection occurred in syphilis.

The disease lasts an indefinite length of time; it is found, according to Parrot himself, in patients showing no other manifestations of syphilis; pathological investigations do not show any specific lesions; and, lastly, still according to Parrot, treatment has no effect upon the disease. If we now consult the experience of other writers we will find that there is no one who can subscribe to the syphilitic origin of the "wandering rash." Parrot has then been misled by the observation of a coincidence into establishing the relation of cause and effect, and the term "desquamative syphilide of the tongue" must be stricken from our list of diseases, certainly, as applied to the "geographic tongue" or "wandering rash." I do not think it would be rash to state that in the three hundred and twenty-eight cases of hereditary syphilis observed by Parrot a greater number than fifteen would have been found that had stomatitis mycosa, and yet no one would think of considering thrush as a syphilitic manifestation. Syphilis, then, plays no rôle in the production of this disease; the question that arises is as to its etiology. As has been stated, we do not know what are the causes of the "wandering rash." The most commonly accepted view that it is due to some general disturbance of health or to a stomachic trouble is fallacious. This will be proven by long-continued observation of any individual case as well as by therapeutic attempts. No one ever succeeds in curing this form of tongue either by tonics or by diet. It is doing the patient an injustice to restrict his mode of life in the vain attempt to cure an affection which is harmless and, as far as we know, incurable. There are no symptoms attached to the affection; some authors speak of an itching sensation, but this must certainly be exceptional. In the great majority of cases the diagnosis is an accident, made when the tongue is examined for other reasons. I have observed four cases in which heredity seemed to play a rôle: two children in two families, the mother in one and the father in the other being brother and sister. The cases are, however, not of sufficient frequency for any one observer to work out any law concerning their origin. It has seemed to me that we are dealing with a process of epithelium formation which is natural to those individuals affected, and only to be considered abnormal in that it does not agree with the produc-

tion of epithelium in the great majority of human beings. The slight changes which have been found under the microscope could be just as readily explained by considering them the effect and not the cause of the trouble.

Syphilitic teeth.—The changes in teeth due to syphilis have received considerable attention since they were first described by Mr. Jonathan Hutchinson, and quite a literature has grown up around this one subject. The question is one which has not been conclusively settled, but, nevertheless, the changes which were originally described, and concerning which Mr. Hutchinson has written so often and so well, have been so fully accepted as characteristic of syphilis that it will require the thorough record of a great number of well-observed cases to disestablish this view. On the other hand, a great many changes in the teeth have been noticed and been ascribed to syphilis which, certainly, are produced by a great many other causes. Thus Parrot (*loc. cit.*) divides the “odontopathie atrophique,” as he calls it, into five kinds: the cup-shaped, the sulciformed, the cuspidated, the notched, and the axe-shaped. All these are due distinctly to syphilis. He admits that rickets may produce one or the other form, but, according to him, “rickets is nothing more than the last manifestation of syphilis upon the osseous system.” Without going into details in the discussion of this whole subject, it has reduced itself to the following: Mr. Hutchinson has proven most conclusively that the forms of change which he has noted in his cases were due to syphilis. He has been enabled, by looking at what he considers as characteristic, to read the history of his patient, of his parents, and sometimes of his grandparents. Again, as a result of his deduction, he has been enabled to arrive at therapeutic conclusions which have invariably proved the correctness of his clinical evidence. There is one important link missing in the chain of evidence brought forward by Mr. Hutchinson: no one has ever seen a lesion in the tooth-sac which would prove the correctness of the connection of syphilis with these peculiarly-shaped teeth. One single case, in which a pathological change could be attributed to syphilis, would establish the view most positively. It must be remembered that a great many excellent observers (Nicati, Albrecht,

Bouchut, Grünfeld, etc.) do not recognize these syphilitic teeth as pathognomonic. Again, it must be admitted that it is a very simple matter to call a child syphilitic because it has notched incisors. It does not prove that because the child has notched teeth, and either or both of its parents have had syphilis, that the syphilis is the cause of the notched teeth. If this combination of circumstances is found in a great many cases it might be looked upon as presumptive, but by no means as conclusive evidence. The subject of tuberculosis might be adduced as an illustration; by the general consensus of professional opinion, phthisis was looked upon as an hereditary disease. No one, to-day, looks upon heredity as of any more value than a predisposing cause, either direct or indirect. Bouchut claims that any diathesis or cachexia may produce these peculiar teeth, and adds that he has seen cases in which neither parent had syphilis. ("Clinique de l'Hôpital des Enfants Malades," p. 357, 1884.) The case that he reports, due to an epistaxis and followed by illness during the whole of infancy, seems to settle the whole question. But the great objection, which unfortunately can be raised in all the cases reported as non-confirmatory of Mr. Hutchinson, is that the history does not seem to have been examined as carefully as the subject would warrant. Bouchut's view, if correct, broadens the etiology, but his evidence is, if anything, weaker than Hutchinson's; nor can it be said that the former has added one iota to our conception of the whole process. It is possible that syphilis, like heredity in tuberculosis, is a predisposing cause for the formation of these teeth. We know perfectly well that certain diseases will leave their marks upon the teeth, because we see that those teeth which make their appearance after certain illnesses are deformed. If one lesion, why not another? If an erosion, why not a notch?

Mr. Hutchinson has met this question with the answer, that syphilis produces only certain changes, which is eminently proper, but which may be overturned by subsequent observation. On the other hand, it is exceedingly difficult, perhaps impossible, to prove that syphilis has produced certain well-defined lesions.

The whole subject has not been conclusively settled, but

from all indications certain lesions of the teeth must be looked upon as very strong evidence of the existence of hereditary syphilis. In the presence of these changes the patient or his parents would have to have a very decisive history proving the non-existence of syphilis to make it positive that hereditary syphilis was not at the bottom of the lesions. In the majority of instances, however, we have additional evidences which help us in our diagnosis, so that we are not frequently called upon to rely implicitly upon one sign.

(To be continued.)

CARCINOMA OF THE MEDIASTINUM IN CHILDREN. REPORT OF A CASE AND REVIEW OF THE SIXTY-SEVEN CASES OF MEDIASTINAL DISEASE PREVIOUSLY RECORDED.

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JOHN G., a lad aged eleven years, came under my care in Philadelphia during the fall of 1888, on account of shortness of breath and dyspnoea on exertion, alternating with attacks of apnoea and syncope. The child was the offspring of healthy parents in the better walks of life, and, although he had never been robust, still was considered to be in fairly good health until about four months previous to the first consultation. My notes record his condition at that time as an anæmic, pale, and somewhat emaciated boy, who complained of lancinating chest-pains, some nose-bleed, and a cough which was dry and hacking, unaccompanied by any expectoration. The voice was somewhat more shrill than is usual at his age. A laryngoscopic examination was negative. A blood examination and count simply demonstrated a condition of profound anæmia without any other alteration. There was no distortion or crenating

of the red cells, or a marked disproportion between these and the white corpuscles.

A physical examination demonstrated the fact that the sternum was somewhat unduly prominent over its upper portion; the intercostal spaces corresponding to this region were widened and showed diminished movement. Percussion over this upper sternal region elicited dulness or impaired resonance, most marked towards the right, mensuration showing that the chest was a little larger on this side than upon the left. Vocal fremitus was much impaired over the area under consideration. Upon auscultation it was recorded that the heart-sounds over the dull region were heard with unusual distinctness, even in a child, and that their transmission was unusually widely distributed for a child, in whom the heart-sounds have a much wider distribution than is the case in an adult. The respiratory movement was somewhat impaired on the right side; respiration was jerky and slightly tubular.

It is not our purpose to dwell at length upon the diagnosis of mediastinal disease in the present communication, so suffice it to say that the possibility of the condition being due to either aneurism, plural effusion, or abscess were all considered and excluded, and a guarded diagnosis of carcinoma of the anterior mediastinum was made.

The child grew progressively worse and worse, the shrill voice became aphonic, emaciation became marked, the feet and extremities cedematous, the right heart dilated, basal hypostatic congestion of the lungs arose, and the child succumbed from exhaustion. Singultus, dysphagia, or vomiting, all so common in these cases, did not arise at any time.

Permission could be obtained for but a partial post-mortem examination,—sufficient, however, to demonstrate the presence of a carcinomatous mass, medullary in structure, occupying the anterior mediastinum almost exclusively; it, however, was encroaching inward and involving some of the tissues of the middle mediastinum. The fact that a child's thorax is so much more yielding than an adult's will probably explain why in this case the growth assumed an anterior direction instead of a posterior encroachment. The treatment of our case was palliative throughout; light, easily-digested, and predigested foods were

ordered; mild counter-irritation was occasionally practised; opium was frequently urgently demanded; nitrite of amyl and chloroform were occasionally exhibited to combat the laryngeal symptoms.

The duration of this case, after the symptoms became marked, was about six months.

Diseases of the heart and aorta of course occupy one or other of the mediastinii, but we have so fully considered these diseases elsewhere that we will not again refer to them. Carcinoma of the mediastinum is not a frequent disease in childhood, although the literature presents the following cases.* (See Table I.)

Upon analyzing these eleven cases of mediastinal carcinoma in children we find that the youngest was four years of age and the oldest eighteen; three occurred at twelve years of age, two at eleven, and two at fifteen, showing that between the eleventh and the sixteenth year carcinoma of the mediastinum is most apt to develop in children, and that the male sex in the early periods of life is most liable to the growth of the neoplasm, as of these eleven cases eight were males. In regard to the area involved, we find that the anterior mediastinum was affected alone six times, the anterior and the posterior mediastinum four times, and the "whole left side once," the growth in this instance having its primary seat in the mediastinum. The duration of the disease was in the longest instance three years, and in the shortest one month,—all cases resulting fatally.

SARCOMA OF THE MEDIASTINUM.

The literature presents sixteen cases of sarcoma in this situation in childhood, ranging between the ages of five and eighteen, which we will proceed to analyze. (See Table II.)

These sixteen cases demonstrate the very interesting fact and one worthy of remembrance that sarcoma of the mediastinum is more frequent in childhood than carcinoma of the same structure. Just the converse of this proposition is true of adults, in whom carcinoma is the most frequent in this situation.

* For these and other cases referred to I am indebted to Hare's Fothergillian Essay, 1888, the most complete *résumé* of the subject yet published.

Of the recorded cases of the two diseases, sarcoma has almost a thirty-per-cent. higher rate of occurrence than carcinoma ; the former is also more liable to arise at an earlier age, as twenty-five per cent. of the cases occurred at eight years of age, and twenty per cent. of the cases of carcinoma occurred at twelve years of age, the period of life in the young at which this disease is most usually manifested.

Of these cases nine affected the anterior mediastinum alone, two affected the anterior and posterior mediastinum alone, one affected the posterior mediastinum alone, two affected the "entire" mediastinum, one affected the "sternum," and one affected the "whole thorax."

As appears to be usual in childhood, the anterior mediastinum was affected most frequently ; nine out of the sixteen cases occurred in this locality. In this respect the child resembles the adult, as carcinoma and sarcoma are most frequently seen in the anterior mediastinum.

Sex seems to have a marked relation to the occurrence of the disease, as sixty-six and two-thirds per cent. of the recorded cases were males. This is certainly a striking preponderance of the male sex, and whether it is due to the meagre number of cases upon which to base conclusions of course can only be decided when our literature becomes more voluminous ; however, almost the same relation between the sexes is recorded in carcinomatous deposits, as eight of the eleven cases were males. The same is true of adults, the males suffering much more frequently than the females.

It is worthy of record that sarcoma is so frequently primary in the mediastinum, as we are so accustomed to consider it a growth most liable to metastasis, and in post-mortem examinations of sarcomatous deposits it is most usual to find numerous foci of metastatic deposit ; but when sarcoma is deposited in the mediastinal tissues it seems to have a tendency to remain local, as in these sixteen cases it arose in twelve within the mediastinum, and in twelve of them remained almost within the structure throughout its growth except in two instances, where some extension into the lung parenchyma is noted ; in the remaining four cases the original observers failed to state whether it had its primary origin within the mediastinum or elsewhere.

The records show, as one would suppose, that, owing to the richness of lymphatic tissues in this situation, sooner or later the middle and posterior spaces become affected also.

In regard to the variety of growth which is most frequently met with, our series show that lympho-sarcoma occurred ten times, round-celled sarcoma three times, and in three cases the variety was not mentioned; this again is analogous to the adult, in that the greatest number are classed as lympho-sarcoma. No cases of spindle-celled sarcoma are recorded in the child.

Abscess or suppurative mediastinitis and *non-suppurative mediastinitis* are not infrequent disorders of childhood, more particularly the former, of which eighteen cases are recorded under eighteen years of age in a total of one hundred and fifteen of all ages, and of the latter ten are noted out of sixteen cases of all ages. (See Tables III. and IV.)

Males are far more prone to be affected by mediastinal abscess than females, in the proportion of fourteen to two (in two instances the sex was not stated); the youngest was aged three and a half months, the oldest eighteen years. From the sixteenth to the eighteenth year is the period of life among the young that abscess will be most likely to arise.

Of these eighteen cases, two were tubercular, one scrofulous, five were due to trauma, two cold, three acute, two metastatic, one is recorded as a congestive abscess, and the variety of two is not stated. In ten cases the abscess occurred in the anterior mediastinum; in four, in the posterior mediastinum; in three, in the mediastinum(?); in one case, in the middle mediastinum. Of the first ten cases of abscess, five were due to trauma, which is readily understood, owing to the exposed situation of the anterior mediastinum, which is so accessible to traumatic injuries resulting in mediastinitis and abscess; indeed, all of the traumatic cases recorded are situated in the anterior mediastinum. In looking over the other etiological factors in the production of abscess we note one case following broncho-pneumonia, two tracheotomy, one a metal pen in the throat, another as a sequela of erysipelas. Doudé regards rheumatism as the primary factor in his case, another was a concomitant of caseous bronchial glands, and two were tubercular.

Hare considers that the exanthemata, particularly measles

and typhoid fever, demand attention as causative factors in the production of abscess in the region under consideration; but we are unable to find any cases in childhood in which this relation has been established.

The *duration* of an abscess is very uncertain, depending upon the variety, and varies from six or seven hours after first symptoms noted to one of nineteen years' duration (chronic abscess). Most of the acute cases, however, run a short course, usually terminating in death. Five recoveries are recorded in eighteen cases of all varieties.

Cold abscess is not as frequent among the young as in adults, in whom the proportion is thirty-one of the former to forty-eight of the acute variety. In childhood it is much smaller, —fourteen acute to three chronic cold abscesses.

Mediastinitis, simple or non-suppurative, presents but two cases which come within the allotted age of the present study. Both cases were males, and at about the same age,—ten years. The average age at which adults are affected is but twenty years. One of these cases was associated with pericarditis, and the other appears to have been part of a general process involving the glandular structures of the mediastinum; both cases were fatal, one in a short time, the other within fifteen months.

The number of cases is so small that of course we can draw but few if any conclusions; trauma is not mentioned, and in these two instances, at least, suppuration did not arise, although it is the most usual termination.

LYMPHOMA AND LYMPHADENOMA.

We will not enter upon a discussion as to the relation of lymphoma or lymphadenomatous growths to sarcomata, nor the relative malignancy of the two; suffice it to say that much confusion has and does exist in regard to these matters, and we will, for the present, be obliged to content ourselves with the statement that in some instances lymphadenoma is extremely malignant and in others equally benign, and that lymphoma more frequently manifests the latter characteristic than it does the former. (See Table V.)

Again, it is to be noted that males are affected in the proportion of three to one, and that the deposit occurred in the

anterior mediastinum twice, and in the posterior and entire mediastinum once each.

No cases of *fibroma*, *lipoma*, *hæmatoma*, or *dermoid cysts* are recorded in individuals whose age would allow of a consideration in the present communication, and but one case of *hydatid cyst* (echinococci) of the mediastinum is to be found in the literature; this occurred in a male æt. eighteen, and involved the mediastinum (entire?), also affecting the lungs and intestinal tract. The chief symptoms noted were cough; remittent fever; quick respiration; the duration is not stated, but the patient succumbed to the disease; the presence of echinococci was demonstrated.*

Age is of course an irrelevant factor in the consideration of hydatid disease of the mediastinum, because, no matter what the age may be, should the eggs gain entrance to the body, development of the disease will of course follow.

MISCELLANEOUS DISEASES OF THE MEDIASTINUM.

Following Hare's example, we will now consider some cases which can only, for various reasons, be considered under the above head. (See Table VI.)

GENERAL SYMPTOMATOLOGY OF MEDIASTINAL DISEASE.

The symptomatic manifestations of mediastinal disease are very similar indeed; let the cause be what you will, they all have certain symptoms in common, which is only what we would suppose when the nature of the structure is considered, as all growths must of necessity interfere with the tissues or organs contained in one or other of the mediastinii, and evidences of pressure on either the circulatory or respiratory apparatus are noted in almost all cases; indeed, dyspnoea is an almost invariable concomitant of mediastinal disease, cyanosis is almost as frequent, and pain is a constant symptom, particularly in acute abscess, sarcomatous and carcinomatous deposits; in the two latter dysphagia often becomes an alarming element in the case.

In acute and sometimes in chronic abscess flushes of heat

* Gueterbock, Deutsches Zeitschrift f. Klin. Med., vol. xx. p. 82.

or rigors may be noted, more particularly, of course, in the former; pulsation may be evident not alone to the medical observers but also to the patient, and the abscess appear externally, when the differential diagnosis between this condition and aneurism must be made.

Pain to a greater or less extent is always present; its intensity, of course, depends upon the tissues pressed upon or incarcerated in the new growth; in some instances it remains localized, in others it extends over the thorax, up the neck and down one or other arm.

The cough is somewhat peculiar, and is similar in character to that which has been associated with aneurism; indeed, as the cause of the cough in mediastinal disease and aneurism is probably identical,—*i.e.*, pressure,—it is but natural to find them very similar in tone, intensity, and degree.

Much emaciation is always observed, and in the malignant cases a marked cachexia arises very early in the course of the disease; the pupils are not infrequently irregularly dilated or contracted; the cervical, post-cervical, and occipital glands become hyperæmic, indurated, and enlarged.

CONCLUSIONS.

I. Sarcoma is more frequently found in the mediastinal spaces than any other morbid process.

II. Carcinoma is the next most frequent neoplasm. The converse of these two propositions is true when applied to adults.

III. Abscess occurs next in the order of frequency.

IV. Lymphomata and lymphadenomata are next in order.

The three following conclusions are in accord with Hare's statements, and are also applicable to childhood:

V. The anterior mediastinum is affected far more frequently than are the other two spaces.

VI. More males are affected than females by mediastinal disease, no matter what the variety.

VII. Cancer and sarcoma are necessarily fatal.

VIII. Abscess is recovered from in about thirty-three and one-third per cent. of the cases. This is a less proportion of recoveries than is shown in Hare's summary for all ages, in which about forty per cent. recovered.

Table I.—Carcinoma of the Mediastinum.

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
4	M.	Anterior mediastinum.	All the abdominal contents.	Anorexia and wasting.	A few weeks.	Death.	C. Ferrall, Dublin Jour. Med. Sci., Aug. and Nov., 1846, p. 510.	Encephaloid.	Not stated.
11	F.	Whole left side.	Whole left side.	Dyspnoea and lividity of face.	Not stated.	Death.	Bennett, Intrathoracic Growths, London, 1872, p. 101.	Medullary.	Mediastinum.
11	M.	Anterior and posterior mediastinum, extended from middle dorsal region to sacrum.	Muscles of back, dura mater of cord, pleura, and lungs all were cancerous; cancerous glands in groin; left ureter occluded by cancer of wall of bladder pressing on it.	Great anæmia, swollen belly, and tympanites; numbness of left arm, with œdema of left leg and thigh.	About 2 months.	Death.	Bennett, <i>Ibid.</i> , p. 137.	Encephaloid.	Not stated.
12	F.	Anterior and posterior mediastinum.	Right pleura and lung; heart.	Pain, cough, and dyspnoea.	1 month.	Death.	Burton, Med. Times and Gazette, Sept. 4, 1880, p. 266.	Lymphoid cancer.	Mediastinum.
12	M.	"There existed no mediastinum, neither posterior nor anterior, but this, that the pleura came together and their walls were found attached not only to the lungs but the ribs."	.....	Cough, pain, and dyspnoea.	Not clearly stated.	Death.	Infund, Jour. der Practischen Arznelkunde, xxv. p. 187.	Scirrhus.	Not stated.

12	F.	Anterior and posterior mediastinum.	Pleura, lungs, thoracic gland, and kidney.	Cough, pain, and dyspnoea.	Several years.	Death.	Gross, Phila. Med. Times, ix., 1879, p. 291.	Scirrhus.	Breast.
15	M.	Anterior mediastinum.	Lung, blood-vessels and bronchi; also pericardium.	Dyspnoea, dry cough, pain in chest.	3 or 4 months.	Death.	Wunderlich, Handbuch der Path. und Ther., iii., Bd. 2, p. 673.	A white carcinomatous mass.	Not stated.
15	M.	Anterior mediastinum; entire right side of chest.	Eroded upper ribs; adherent to sternum and costal pleura.	Dyspnoea, croupy, cracked cough; pain between scapulae.	About 3 months.	Death.	Burrows, Medical Times and Gaz., June 7, 1851; also London Jour. of Med., July, 1851.	Soft cancer.	Not stated.
16	M.	Anterior mediastinum.	Kidneys and right lung.	Dysphagia and dulness on percussion on right side; dyspnoea.	1 month.	Death.	Barker-Trans. Path. Soc., London, vol. vii., p. 45.	Not stated.	Mediastinum.
17	M.	Anterior mediastinum.	Attached to upper surface of diaphragm; surrounded trachea and roots of lungs; adherent behind the chest-wall.	Dyspnoea; dulness over entire side on the left; cyanosis.	Seen 9 weeks.	Death.	Thompson, Medical Mirror, London, 1865.	Scirrhus.	Mediastinum.
18	M.	Anterior mediastinum.	Pressed on bronchus and displaced heart; adherent to pericardium.	Dyspnoea and pain; tumor pulsated.	3 weeks after appearance of tumor.	Death.	Nélaton, Bull. de la Soc. Anat., 1853, p. 105.	Not stated.	Not stated.

Table II.—Sarcoma of the Mediastinum.

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
5	F.	Anterior mediastinum; extended from sternal notch to diaphragm.	Enclosed pericardium and heart on all sides except the back; glands in posterior mediastinum enlarged.	Cachexia; edema of face; purpura hæmorrhagica; spleen enlarged; low bodily temperature.	3½ months.	Death.	Gangue, Edin. Med. Jour., March, 1873, p. 797.	Lympho-sarcoma.	Thymus.
5	M.	Anterior mediastinum.	Attached to sternum and upper part of pericardium; superior vena cava thickened.	Cyanosis; loss of flesh; vocal fremitus impaired.	10 months.	Death.	Coleb, Inaug. Dissertation, Marburg, 1870.	Lympho-sarcoma.	Mediastinum.
8	M.	Mediastinum.	Growth invaded lungs along bronchi; infiltrated pericardium and upper part of auricles, also glands of mediastinum.	Dyspnoea mainly expiratory.	Over 2 months.	Death.	Hutton, Brit. Med. Jour., vol. 1, 1887, p. 735.	Not stated.	Not stated; probably mediastinal.
8	M.	Anterior mediastinum.	Involved lungs and pericardium; pressed on trachea.	Cough; dyspnoea; cyanosis; veins of right side of face full.	2 or 3 years.	Death.	Gritzner, Dissertation, Berlin, 1869.	Lympho-sarcoma.	Mediastinum.
8	M.	Whole thorax.	Affected pericardium and spread into lungs, along vessels and bronchi.	Not stated.	Urgent symptoms lasted 8 weeks.	Death.	Hutton, Lancet, Lond., 1887, April 30, p. 883.	Not stated.	Glands of mediastinum.
8	M.	Anterior mediastinum.	Edges of right lung; vena and pulmonary artery involved.	Cough, dyspnoea, cyanosis, and swelling of glands; pain in chest.	About 5½ months.	Death.	Rosenberg, Ueber Mediastinal-tumoren bei Kindern, Göttingen, 1884.	Lympho-sarcoma.	Thymus or gland of mediastinum.
9	F.	Anterior and posterior mediastinum.	Sternum, ilium, sacrum, and vertebrae.	Palsy of lower extremities; wasting.	3½ months.	Death.	Jones, St. Barthol. Hospital Reports, 1884, xx. p. 225.	Round-celled sarcoma.	Not stated.
9	F.	Sternum.	All vertebrae below the fourth dorsal.	Palsy of lower extremities; sensation partly lost; incontinence of urine and feces.	40 days.	Death.	St. Barthol. Hosp. Rep'ts., vol. xx. p. 225.	Lympho-sarcoma.	Not known.

11½	M.	Entire mediastinum.	Involved pericardium.	Cough; pain in chest.	3 months.	Death.	Huber, Deutsch. Arch. f. Klin. Med., xvii. p. 496.	Lympho-sarcoma.	Not stated.
14	M.	Anterior and posterior mediastinum.	Adherent to sternum, ribs, and diaphragm; attached to pericardium; pleural cavities contained much fluid.	Dyspnoea; blueness of face; jugulars swollen.	3 weeks.	Death.	Cole, Lancet, Lond., Oct. 23, 1875, p. 586.	Lympho-sarcoma.	Not stated.
14	M.	Anterior mediastinum.	Compressed trachea; enlarged veins of chest, particularly the superior vena cava; implicated the oesophagus and pericardium at base.	Asphyxia; signs of tracheal stenosis; neuralgic pains in left arm and shoulder; enlarged glands above clavicle; cedema and cyanosis of face.	9 months.	Death.	Wiss, Proc. 9th Internat. Med. Cong., 1887, Sect. Dis. of Child.	Lympho-sarcoma.	Thymus gland.
15	M.	Anterior mediastinum.	Brachial plexus and all the vessels on the left side, subclavian, carotid, jugular, and innominate, were all included in the growth.	Cough; pain in left arm; rigors and night-sweats.	2½ months.	Death.	West, Trans. Path. Soc., Lond., 1883, vol. xxxiv. p. 253.	Round-celled.	Anterior mediastinum.
15	M.	Chiefly in posterior mediastinum.	Pressed on lung; oesophagus involved; left arm cedematous.	Left pupil contracted; pain in chest; cedema.	5 months.	Death.	Smith, Brit. Med. Jour., Dec. 30, 1876, p. 869.	Lympho-sarcoma.	Mediastinum.
16	F.	Anterior mediastinum; reached from thyroid to diaphragm.	Pericardium involved; pleura adherent to sternum and ribs.	Dyspnoea and enlargement of cervical veins.	3 months.	Death.	Albutt, Brit. Med. Jour., Sep. 5, 1874, p. 300; also Rev. des Sci. Médicales, vol. v. p. 530.	Not stated.	Mediastinum.
17	M.	Anterior mediastinum.	Metastasis to heart-muscle, and both kidneys.	Cough, fever, anorexia, and cyanosis.	25 days.	Death.	Schreiber, Deutsch. Arch. f. Klin. Med., xxvii. p. 52.	Round-celled sarcoma.	Anterior mediastinum.
18	M.	Anterior mediastinum.	Pericardium, aorta, and trachea were compressed.	Dyspnoea.	2 months.	Death.	Gee (reported by Moore), Trans. Path. Soc., Lond., xxxv. 374.	Lympho-sarcoma.	Anterior mediastinum.

Table III.—Abscess.

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
3½ mos.	.....	Posterior mediastinum.	Pressed on trachea.	Sudden dyspnoea; lividity of face.	6 or 7 hours after first symptoms.	Death.	Turner, Lancet, Lond., 1887, i. 17.		
5½ mos.	M.	Glands of anterior mediastinum.	Lungs studded with tubercle.	Cough and dyspnoea.	3½ months.	Death.	Ballard, Trans. Path. Soc., Lond., ix. p. 38; also Lancet, 1858, p. 143, Feb. 6.	Tuberculous abscess.	
18 mos.	M.	Suppurating tuberculous mediastinal glands.	Opened externally at supra-sternal notch and right second interspace.	Wasting and night-sweats.	4 months.	Death.	Smith and Lankes-ter, Med. Times and Gaz., Oct. 18, 1884, p. 539.	Tubercular.	
4	M.	Posterior mediastinum.	Abscess reached from sixth cervical to fifth dorsal vertebrae.	Dyspnoea and quick respiration.	Short, not stated.	Death.	Jarisch, Jahrbuch. f. Kinderheilk., Oct. 3, 1874, p. 188; also Rev. des Sci. Méd., vol. v. p. 609.	"Congestion abscess."	Due to Broncho-pneumonia.
5½	F.	Anterior mediastinum.	Gangrene of edge of wound.	Skin livid; rapid pulse.	6 days.	Death.	Martini, Schmidt's Jahrbücher, vol. cii. p. 91.	Traumatic.	Emphysema following tracheotomy.
8	M.	Glands of posterior mediastinum	Gland on right side was greatly enlarged, caseous and suppurating; vagi adherent to it; broncho-pneumonia and pleurisy of both bases.	Dyspnoea and cough; vomiting.	About 15 days.	Death.	Goodhart, Brit. Med. Jour., April 12, 1879.	Cold (?) abscess.	
Yo'ng lad.	M.	Anterior mediastinum.	Pyopericardium.	Great thirst; pulsating tumor of sternum.	1½ months.	Death.	Rich and Bowen, Liverpool Med. and Chir. Journal, 1882, ii. 344.	Acute abscess.	
11	M.	Posterior mediastinum.	Opening from mediastinum into pharynx.	Pains in chest; pus in expectorated fluid.	9 days.	Recovery.	See Bull. de la Soc. de Chirurg., N. S. i. p. 271, 1876.	Acute.	Metal pen in throat.

Boy.	Anterior mediastinum.	Cavities of sternum.	Not stated.	19 years.	Recovery.	Daudé, Les Affections de Mediastin, Paris, 1872.	Traumatic cold (?).	Fracture of ribs.
13	Anterior mediastinum.	Separation of sternal fragments and pulsating tumor between fragments.	Symptoms simulating aneurism.	Not stated.	Recovery.	Smith, quoting Warner, "Gases in Surgery," Amer. Jour. Med. Sci., April, 1873, p. 311.	Traumatic.	Fracture of sternum; abscess; thirst extremely.
Boy.	Mediastinal glands.	Opened into trachea with escape of pus.	Sudden dyspnoea while at play; cyanosis.	Short.	Death.	Johnson, Brit. Med. Jour., Oct. 27, 1877, p. 592.	Probably scrofulous.	Had caseous bronchial glands.
16	Anterior mediastinum.	Not stated.	Malnutrition, chill, fever, and redness of right knee.	5 months.	Recovery.	Daudé, Les Affections du Mediastin, Paris, 1872, p. 57.	Metastatic.	Rheumatism said to be primary cause.
16	Mediastinum.	Not stated.	Fever, chills, and pain in chest.	.....	Recovery.	Weber, Zeitsch. Med. Chir. und Geburtsh., Magdeburg, 1856, x, p. 58.	Cold abscess.	Mediastinum.
17	Middle mediastinum.	Pressed on vagi; lungs engorged.	Pain; dyspnoea and cardiac palpitation; disturbed respiratory movements.	.....	Death.	Winsor, Best. Med. and Sur. Jour., 1867, lxxxvi, p. 63.	Metastatic.	Face and upper lip. Erysipelas.
17	Anterior mediastinum.	Sternum contused and burnt.	Pain.	5 months.	Recovery.	Walker, Brit. Med. Jour., p. 63, Jan. 12, 1884.	Traumatic.	Struck in chest by red-hot iron.
Child,	Anterior mediastinum.	Tissue behind trachea.	Pain, oppression, and lividity of face.	9 days.	Death.	Martini, Schmidt's Jahrbücher, vol. cli, p. 91.	Traumatic.	Emphysema after tracheotomy for croup.
18	Anterior mediastinum.	Luxation of manubrium and ensiform cartilages; third rib separated from sternum; lungs and pleura adherent to pericardium, which contained serum.	Marasmus.	Some months.	Death.	Duncan Reid, Annales de Schmidt, 1835, vol. i.		
18	Anterior mediastinum.	Opened between third and fourth ribs; sternum cartilages; pericarditis; pleura and lungs slightly inflamed.	Pain in chest and left shoulder-blade.	Not stated.	Death.	Pfeuffer, Henkes und Pfeuffer's Zeitschrift, 1, 2; also Schmidt's Jahrb., Sept. 4, p. 273.	Mediastinitis resulting in abscess.	Scrofulosis.

Table IV.—Mediastinitis—Non-Suppurative.

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
9	M.	Pericardium and mediastinum.	Thickening of bronchi; increase of fibrous tissues in lungs; hepatitis.	Not stated.	15 months.	Death.	Hutton, Brit. Med. Jour., March 18, 1884, p. 462.	Mediastino-pericarditis.	Pericardium and mediastinum.
10	M.	Middle mediastinum particularly.	Glands about trachea matted together, involving the large blood-vessels; adherent to pericardium.	Face and abdomen swollen; veins on chest prominent.	A short time.	Death.	Abstract of Med. and Surg. Cases, General Hospital for Sick Children, 1883, Pendlebury, Manchester, 1884.	Mediastinitis.	Mediastinum.

Table V.—*Lymphoma and Lymphadenoma.*

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
5	M.	Entire mediastinum.	Double pleurisy; trachea and bronchi involved.	Dyspnea and cyanosis.	4 months.	Death.	Rosenberg, Beitrage zur Casuistik der Mediastinal-tumoren bei Kindern.	Malignant lymphadenoma (probably a sarcoma).	
6	M.	Anterior mediastinum.	Tissues to left of sternum infiltrated by a yellowish mass.	Rapid breathing; dyspnea; glands of neck enlarged; pain in chest.	5 months.	Death.	Clay, Journal Anat. and Physiol., 1879, p. 498.	Lymphoid.	Thymus gland.
12	M.	Posterior mediastinum.	Side of chest; heart pushed to right; surrounded the vagus; left side of chest nearly full of liquid.	Pain in lower part of chest; cough, with traces of blood in sputa.	About 8 months.	Death.	Church, St. Bartholomew's Hosp. Reports, xiv, 1878.	Lymphoma.	
17	F.	Anterior mediastinum; reached from thymus to diaphragm, and laterally to each lung.	Attached to pericardium; lungs involved; glands at root of neck enlarged; glands all over body enlarged.	Dyspnea; urine laden with filices, but otherwise normal; temperature ranged from 96.5 to 104.2° F.	13 months.	Death.	Bennett, Intrathoracic Growths, London, 1872, p. 148.	Lymphadenoma.	

Table VI.—Miscellaneous Diseases of the Mediastinum.

Age.	Sex.	Area Involved.	Other Parts Affected.	Chief Symptoms.	Duration.	Result.	By whom and where Reported.	Variety.	Primary Seat.
8 mos.	F.	Glands of posterior mediastinum.	Glands red and fleshy, but caseous; enlarged thymus.	Crowing respiration.	Not stated.	Death.	Goodhart, Brit. Med. Jour., April 12, 1879, p. 542.	Enlarged glands.	Mediastinum.
8 mos.	M.	Glands of anterior mediastinum.	Thymus enlarged; pressed on sternum.	Dyspnoea.	Not stated.	Death.	Goodhart, Brit. Med. Jour., April 12, 1879, p. 542.	Enlarged glands.	
22 mos.	Not stated.	Posterior mediastinum.	Ulcerated into mediastinum; bodies of 2d, 3d, and 4th cervical vertebrae were carious.	Neck swollen; hoarseness; febrile breath and cough.	3 months.	Death.	Journal Général de Médecine, tom. xlii. 1807.	Foreign body.	Carious bone.
2½	F.	Enlarged mediastinal glands; no tubercle.	One gland opened into trachea and caused death.	Dyspnoea and fits.	2 months (?).	Death.	Goodhart, Brit. Med. Jour., April 12, 1879, p. 542.	Enlarged glands.	Mediastinum.
4	Not stated.	Middle and posterior mediastinum.	Bronchial glands very large and tuberculous; involved pulmonary arteries, veins, and vagi.	Constant pain in epigastrium; rapid respiration; cyanosis.	7 weeks.	Death.	Gravenhorst, L'Union Méd., Feb. 5, 1867, p. 254.	Tuberculous glands.	
5 or 6 years.	Not stated.	Middle mediastinum.	Opening five inches deep between oesophagus and trachea; this opening communicated with trachea.	Vomiting; rapid emaciation.	A few days.	Death.	Edinb. Med. Jour., 1848.	Foreign body.	
7	M.	Posterior mediastinum chiefly.	Inflammation of oesophagus, of purulent character; pleurisy and peritonitis.	Asbestos and hydrothorax; dyspnoea and pleurisy.	Not stated.	Death.	Eberth, Deutsch. Arch. f. Klin. Med., Bd. xxviii., Heft 1.	Myoeitic mediastinitis	Mediastinum. Scarlet fever (?).

Child.	F.	Glands in mediastinum.	Cavity in right lung; glands between bifurcation of trachea and superior vena cava were diseased.	Cyanosis; coma; edema of face.	Not stated.	Death.	Basari, Jahrb. f. Kinderkrankheiten, xli. p. 415, 1878.	Tuberculous glands.	Anterior mediastinum. Blow on chest.
9	M.	Anterior mediastinum.	No post-mortem.	Not stated.	3 weeks.	Still alive.	Jones, Brit. Med. Jour., 1880, i. p. 286.	Cystic tumor.	
Boy.	M.	Anterior mediastinum.	Pericardium contained pus.	Great thirst; pulsating tumor of sternum.	1½ months.	Death.	Rich and Bowen, Liverpool Med. and Chir. Jour., 1882, ii. p. 344.	Pulsating tumor of sternum.	
Child.	Not stated.	Entire mediastinum.	Emphysema of lung connecting with mediastinum.	Symptoms of emphysema.	.....	Death.	Baerwinkle, Jahrbuch, vol. lxxxii. p. 63.	Emphysema.	
15	F.	Entire mediastinum.	Heart displaced by growth; aorta involved; also the pulmonary artery.	Pain; cough; rapid pulse.	2 months.	Death.	Goetz, Berlin. Klin. Wochen., 1885, xxii. p. 83.	Tumor; variety not stated.	
18	M.	Anterior mediastinum.	Tubercles in lung; hypertrophy and suppuration of thymus gland.	Pain in chest; oppression and cough.	.....	Death.	Wittich, Arch. f. Path. Anat., tom. viii.	Thymus.	
18	M.	Anterior and posterior mediastinum.	Bronchial glands and glands in lumbar region enlarged; spleen, liver, and kidneys enlarged.	General droop; anemia and weakness.	1 year.	Death.	Wilks, Tran. Path. Soc., Lond., vol. x. p. 259.	Lardaceous deposit.	"Glandular system."
11	F.	Diagnosis made by physical signs; cyanosis and pain in chest.	3 years.	Not dead reported.	Rosenberg, Beitrage zur Casuistik der Mediastinal-tumoren bei Kindern.	Not stated.	The report of this case is very incomplete and indefinite.

TETANY.

BY J. LEWIS SMITH, M.D.,

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(Continued from June Number.)

Symptoms.—Ordinarily tetany occurs without any marked premonitory symptoms, but in some instances it is preceded by pain in the head or spine, vomiting without any previous indigestion or gastric derangement, and a general feeling of indisposition. Usually, in those old enough to express their sensations, tetany begins with tingling, burning, or other unusual sensory manifestations in the limbs. The tonic contractions occur suddenly, sometimes in the upper and lower extremities simultaneously. Rarely, the contractions occur in the upper extremities alone, or in the muscles of the trunk. At first a feeling of stiffness is experienced, and this is followed by the tonic contraction, with the fixing of the affected part in a state of persistent flexion or extension. Usually, as regards the upper extremities, the contraction of the thenar and hypothenar muscles causes hollowness of the palms of the hands; the first phalanges of the fingers are flexed, the second and third phalanges extended, and the thumb adducted and flexed so as to press against the index finger, or lie underneath it. The fingers sometimes incline towards the ulnar side, and sometimes are pressed against each other. Usually the hand is slightly flexed, as is also the forearm. The muscles which move the arm usually escape, but exceptionally there is adduction of the arm on the shoulder. The hand may be extended instead of flexed, and all the joints of the fingers extended, or they may all be flexed and the fist closed.

The thighs may be adducted or flexed, the legs extended or flexed, the foot extended, forming a talipes equinus, and the toes flexed, as in the following interesting case now in Charity Hospital. This case was briefly alluded to in the June number of the ARCHIVES.

Mary F. O., native of the United States, seamstress, married, and of apparently healthy parentage, states that her health was good previous to the present sickness. She says that she has never had venereal disease and never taken stimulants in excess, though in the habit of using whiskey at breakfast. She has been married four years, and three years ago had a still-born child at the seventh month, but has had no other miscarriage, and has had no confinement at term. Her catamenia, which formerly were scanty and at unusually long intervals, have during the last four months been normal in regard to time and quantity. She has been subject to afternoon headaches for years. She has had the average appetite, has partaken largely of rye bread at her meals, and her stools have been normal.

In January, 1888, the patient being employed as a seamstress in a shop at a distance from her residence, began to experience unusual fatigue, and on returning from her day's work she frequently noticed a painful burning sensation in her feet, the pain extending upward along the calves of her legs. This pain in the feet and legs gradually increased until March 12, 1888, at the time of the deep snow accompanying the blizzard. After walking through the snow she sat all day at her work with wet feet, and at this time she began to experience a dull intermittent pain extending from both ankles to the knees, and accompanied by great lassitude, so that walking required an effort. In July the pain became more constant, but at the time of her admission into Charity Hospital (August 17) it was not so constant or severe. Soon after her admission the feet became strongly extended, forming a talipes equinus, and the toes of both feet were also strongly flexed. Sensation in the toes, but not in the feet, was almost completely lost. A few days subsequently the fingers on both sides were similarly flexed, but without pain or loss of sensation. In about six months the flexion of the fingers ceased, and she can now use them nearly as well as before the attack. The toes, also, are not so strongly flexed as at first, and they have regained sensation. The bladder has never been affected, but the sphincter ani was paralyzed for a time in August, so that the feces escaped involuntarily in bed. The patient's

memory was considerably impaired after the exposure at the time of the blizzard, but is now (June, 1889) apparently nearly or quite normal. Otherwise no impairment of the mental faculties has been observed.



The tetany in this case has been, as usual, bilateral and for the most part equal on the two sides, with a little more acuteness of sensation in the right than left limbs. The feet continue in the position of talipes equinus, with toes flexed, and the contracted muscles hard to the feel, almost like cartilage. No cedema has been observed, but perspiration occurs from the extremities during sleep.

In mild cases, or those of ordinary severity, the contractions are limited to the muscles of the extremities, and are more marked and persistent in those that move the hands, feet, fingers, and toes than in other muscles; but in severe cases the muscles of the trunk and head participate. Contraction of the abdominal muscles produces rigidity of the abdominal walls. Spasm of certain of the thoracic muscles occasionally occurs, causing dyspnoea and even lividity. In some of these cases of embarrassed respiration the diaphragm is probably involved. Opisthotonos, retention of urine, anteflexion of the neck from contraction of the sterno-mastoids, fixation of the jaws from spasm of the masseters, retraction of the angles of

the mouth, stiffness of the tongue, and indistinct articulation are occasional symptoms in severe cases of tetany.

The contractions render the affected muscles hard and unyielding, and the child cries from pain when attempts are made to straighten the limb. If the spasm be slight, some voluntary movement of the affected muscles is possible, but it is restrained and difficult. In severe cases, with the muscles tense and unyielding, voluntary motion is impossible. Except in the mildest forms of the disease, pain is felt in the contracted muscles, such as all people experience when a spasm occurs in the calf of the leg, and the pain may pass upward along the limb. The pain may occur in paroxysms with distinct intermissions, or, without ceasing, it may vary in severity at different times, probably from some variation in the degree of spasm. Certain subjective symptoms, such as numbness and tingling, which sometimes occur in tetany, may continue during the intermissions or remissions. After some hours or days, the rigidly-contracted muscles relax and the disease disappears, except, perhaps, that a degree of stiffness remains. But the respite is usually not long. The spasms recur, and several successive recurrences and intermissions take place, running over months, before the disease is permanently cured. During the intervals in the contractions the affected nerves and muscles are in ordinary cases unduly excitable, so that sudden pressure or percussion causes some contraction. Trousseau was perhaps the first who noticed and called attention to the fact that compression of the artery and nerve supplying the contracted muscles in tetany causes or increases the contraction. Occasionally this result cannot be obtained.

It is an interesting fact that in cases which I have observed the spasms do not cease in sleep, though the contraction of the muscles may not be as great as when the patient is awake.

The electrical excitability of the nerve which supplies the contracted muscles is increased. Gowers states that he has obtained contractions in the muscles of the face by the voltaic current from a single cell. The increased excitability of the nerves is apparent if either the direct or induced current be used. According to Erb, when the circuit is closed the earliest

contractions occur at the point of application of the positive pole. Both opening and closing the circuit cause a more prolonged contraction of the muscles in tetany than in health. When the contractions are strong, œdema sometimes occurs, especially upon the dorsal surfaces of the hands. It was present in cases treated by Hænoch, who attributes it to compression and consequent passive congestion of the veins, produced by contraction of the interossei muscles, the congestion giving rise to serous transudation. When the paroxysms are severe perspiration sometimes occurs, and an erythematous redness may appear over the affected muscles. Occasionally in acute attacks the temperature is moderately increased, but ordinarily it is normal. Tetany does not usually affect the functions of the internal organs, but in a case related by Kussmaul, and another by Nöthen, albuminuria was for a brief period present, and in one recorded instance the urine exhibited traces of sugar during the paroxysms. Occasionally in long-continued tetany the contracted muscles undergo a degree of atrophy, which is attended by diminished electrical irritability. Gowers states that "general muscular atrophy" has also been observed following tetany.

The following may be regarded as typical cases of tetany in infancy as I have observed it in New York. The following case occurred in the New York Infant Asylum during my term of service, and the resident physician, Dr. Virginia M. Davis, has kindly furnished me the history from her note-book.

Gertrude A., born in the New York Infant Asylum, April 30, 1888, was well except a mild attack of pertussis until March 9, 1889, when she had a prostrated appearance, and the thermometer indicated a temperature of 105° , and a little later 105.5° . During the following six hours she had five large, watery, but yellow stools. She was restless, her features sunken, extremities cool, her surface covered with a clammy perspiration, and her pulse feeble. Her diarrhœa was checked, and she slept during the following night. From March 9 to 14 she had slight fever (100.4° – 100.6°) and her stools were normal, but during the week ending with the 14th, she lost one pound in weight. The following are the subsequent notes of the case :

March 14. Is restless; temperature in the morning 100.4° , in the evening 103° ; has had no stool in the last twenty-four hours. To-day has had for the first time contraction of the flexor muscles of the hands, feet, fingers, and toes, so that in the evening all the fingers and toes are firmly flexed. The dorsal surfaces of the hands and feet, and the fingers and toes as far as the articulations of the first and second phalanges, are oedematous. The flexions can be overcome by the employment of considerable force, but the attempt is painful. An erythematous eruption has appeared over the upper part of the chest and upon the back.

March 15. Temperature, 100.6° ; thumbs extended, voluntary movement of fingers returning; toes still flexed; oedema as before, rash fading; stools normal. March 16. Temperature 99° – 99.8° . The contractures have entirely disappeared during the day. Had four stools. 17. Bowels constipated; slight contractures of the fingers. 18. Morning temperature 103° ; evening, 101° . In the evening contractures of both extremities disappearing; stools normal; gums swollen. From this time the constipation was relieved by small doses of calomel, and the tetany ceased. Some elevation of temperature was a prominent symptom previous to and during the tetany, and on one day (May 17) an attack of general clonic convulsions or eclampsia occurred. The tetany ceased on the 18th or 19th, but between the 20th and 30th maculæ and papules appeared on the surface, due, perhaps, partly to the medicines employed, which were chiefly the bromides and chloral.

CASE II.—Edward McL., aged fifteen months (practice of Dr. Vineberg, but examined by myself), has healthy parentage, and no other child in family has had any nervous ailment, except a single attack of eclampsia during measles in one of the children. Edward is nourished in part at the breast and in part from the table. He has four teeth, all having cut the gum since the age of twelve months. He has had diarrhœa much of the time since birth, and during the last two months has had free perspiration from the head. The mother states that during the first months of his life he occasionally held his breath, especially at night, but, with this exception, no symptoms resembling a convulsive attack were observed until re-

cently, when, during an attack of coughing, his face grew red, his eyes turned upward, and his respiration ceased for a moment. When he was at the age of twelve months the mother first noticed that the toes were flexed and the feet extended as in talipes equinus. Considerable force was required to overcome the tonic contraction of the affected muscles, and when the pressure was relaxed the feet immediately assumed the former position of talipes. The thumbs were strongly flexed across the palms of the hands, the index and middle fingers forcibly extended and separated from each other, and the ring and little fingers were flexed against the palm. These abnormal flexions and extensions continued more than three months, with occasional intervals of two to three days during which the action of the affected muscles was nearly normal. The child presents evidences of rachitis in the shape of its head and enlargement of the epiphyses of the extremities.

The treatment employed by Dr. Vineberg consisted in change of diet and in the use of the following prescription :

R Zinci sulphat., gr. $\frac{1}{4}$;
 Atropiæ sulphat., gr. $\frac{1}{16}$. Misce.
 To be taken three times daily.

With this treatment the spasms of the muscles entirely disappeared within a week, and two weeks later had not returned.

It is our purpose to treat mainly of tetany as it occurs in children ; but in order to give completeness to our remarks on this disease, it is necessary also to describe it as it occurs in the adult. The following case, related by Trousseau, gives a clear and vivid idea of the symptoms of severe tetany as it occurs in the adult. A dissipated young man was found one morning lying in the street, "stiff as a poker," from the occurrence of tetany during the night. He was conscious, and complained of great pain, but spoke indistinctly, from the clinched state of his jaws. Muscles in his extremities were rigidly contracted, and, being unable to walk, he had fallen down, and could not rise. The rigidity of the muscles of the chest and abdomen, and probably of the diaphragm, rendered respiration difficult. His face was livid, and he had paroxysms of dyspnœa that threatened suffocation. The tetany

finally abated, and he was able to walk and attend to slight duties, but at intervals he had recurrences of the spasms, and finally died of phthisis.

Adults, unlike young children, give a clear description of their subjective symptoms. Frequently, probably in a majority of instances in the adult as in the child, tetany is preceded by certain sensory symptoms, as formication, a sensation of weight or dragging, of heat or cold, or even of pain. Soon afterwards in using the limbs the patient observes some stiffness, or that the movements are not so free and easy as previously. The spasms succeed, and, as in children, their duration and severity vary greatly in different patients. In the adult, as in the child, in mild tetany, the contractions are limited to the muscles of the hands, feet, fingers, and toes, and the severe disease usually attacks first these muscles, and afterwards extends to the muscles of the head, face, neck, and trunk. Cases might be cited from the literature of tetany in which the contractions occurred in the muscles of the face, causing unsightly visage; the motor muscles of the eye, causing strabismus; the pharyngeal and laryngeal muscles, the muscles of the tongue and diaphragm, causing embarrassment of speech, respiration, and deglutition; sterno-cleido and other muscles of the neck, changing the position of the head, and in the various muscles of the trunk. In a case observed by Dr. Herard the recti muscles in the abdominal muscles stood out like two tense cords. However severe the disease may be, a marked remission or distinct intermission soon occurs, the progress of tetany being characterized by intervals of complete relief. In not a few of the reported adult cases tetany has reappeared at varying intervals during a series of years, being due to the recurrence of the causes which first produced it.

(To be continued.)

NOTES ON INFANT FEEDING.

BY T. M. ROTCH, M.D.,

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It has so happened during the past three or four years that I have met with a number of cases connected with the subject of infant feeding, which, being under complete control, could be investigated with unusual precision.

The notes on these cases and the deductions made from them may be of some practical importance to the general practitioner, in this summer season, and I have therefore embodied them in this article, with such general remarks as are necessary to elucidate the subject.

The breast-milk at times is found to cause such serious symptoms of indigestion in the infant that a change to artificial food seems almost a necessity. There is no doubt, however, that in many instances the infant is weaned for insufficient reasons, and that a more extended knowledge of the conditions which influence the breast-milk as a food will enable us to manage this class of cases more intelligently.

The direct analysis of the milk, as a means for determining the especial ingredient of the food which is causing indigestion in the infant, is something which is being made more and more use of, and will in the future aid us very materially. Even now, although the knowledge which we have derived from this source is still very imperfect, we can make certain deductions from the figures which are presented to us, which will often prove of considerable value in helping to determine the various questions which arise regarding the feeding. Among the difficulties which have so far been found, the greatest, in obtaining correct information from the analysis of human milk, are, that the proper percentages of the different ingredients of the ash have not been reliably determined, as they have in cow's milk. Also, that the analyses, as usually made, represent only a partial information as to the proportion

of total solids and water which the stomach of the infant contains at the end, not only of the nursings as a whole, but of each individual nursing. Thus this proportion of the total solids to the water differs so materially, according as the milk drawn for analysis is taken before the breast has been nursed or just at the end of the nursing, that the resulting analysis, though correct chemically, may be very misleading clinically, as will be best understood by referring to the following figures, which present examinations of the "fore milk," "middle milk," and "strippings."

ANALYSIS I.

Cow's Milk. (Harrington.)*

	Total Solids.	Water.
"Fore milk"	13.34	86.66
"Middle milk"	15.40	84.60
"Strippings"	17.13	82.87

Analysis II. also illustrates well what has just been said, and represents the "fore milk" of a healthy primipara whose baby was thriving and gaining from half to three-quarters of a pound a week. This gain could hardly have been made if the percentage of fat, as shown in the analysis, had not been considerably raised by the "middle milk" and "strippings," which the infant received at each meal as well as "fore milk."

Analysis II. is in fact essentially that of a typical "fore milk."

ANALYSIS II.

Woman's Milk. (Harrington.)

Fat	0.18
Sugar	6.80
Ash	0.13
Albuminoids	1.83
Total solids	8.94
Water	91.06
	<hr/>
	100.00

The analogy between the mechanism of the mammary glands in animals and human beings is so close that the reasoning which will hold true for one can, in most cases, safely be used for the other.

* Eighth Annual Report, State Board of Health, 1884, p. 189.

We thus see that where an analysis is made simply of the "fore milk," which is almost always the case in woman's milk, we might be seriously mistaken in supposing the total solids to be much lower in their percentage than was actually the case, and thus again be led to suppose that dyspeptic symptoms had been caused by a much lower percentage of total solids than in reality was contained in the entire quantity of the milk taken. We must then recognize, as practical physicians, that we should not rely merely on the opinion of the chemist, who gives us his figures of an especial analysis, and, as is the custom, states, "This is a good or poor milk." The chemist cannot tell us whether the milk is good or bad for the especial infant that we have charge of, nor can he tell us the various influences which may temporarily be making a good milk appear poor or the reverse. The answers to these questions should be made by the physician himself, who should take the chemist's figures and interpret them according to the varied circumstances of the case. In order that the physician should be able to do this intelligently, he must make use of all the physiological knowledge of the mammary gland, its function and its secretion, which we possess, and it may, perhaps, be well to review this knowledge for the purpose of understanding better what will be said later.

Bunge's* investigations on the comparisons of tissues show that the mammary gland abstracts from the blood just about the amount of salts found in the tissues. According to Foster,† "milk is the result of the activity of certain protoplasmic cells forming the epithelium of the mammary gland. So far as we know, the fat is formed in the cell through a metabolism of the protoplasm. Microscopically the fat can be seen to be gathered in the epithelium-cell in the same way as in a fat-cell of the adipose tissue, and to be discharged into the channels of the gland either by a breaking up of the cells or by a contractile extrusion very similar to that which takes place when an amœba ejects its digested food.

"This observation is thoroughly supported by other facts.

* "Archiv für Physiologie," 1886, 539.

† "Physiology," p. 564.

Thus the quantity of fat present in the milk is largely and directly increased by proteid food; but not increased, on the contrary diminished, by fatty food. In fact, proteid food increases, and fatty food diminishes, the metabolism of the body. A bitch fed on meat for a given period gave off more fat in her milk than she could possibly have taken in her food, and that, too, while she was gaining in weight; so that she could not have supplied the mammary gland with fat at the expense of fat previously existing in her body. We also have evidence that the casein is, like the fat, formed in the gland itself. When the milk is kept at 35° C. outside of the body the casein is increased at the expense of the albumen.

"When the action of the cell is imperfect, as at the beginning and end of lactation, the albumen is in excess of the casein; but, so long as the cell possesses its proper activity, the formation of casein becomes prominent.

"That the milk sugar is also formed in and by the protoplasm of the cell is indicated by the fact that the sugar is not dependent on a carbohydrate food, and is maintained in abundance in the milk of carnivora, when these are fed exclusively on meat, as free as possible from any kind of sugar or glycogen. We thus have evidence in the mammary gland of the formation, by the direct metabolic activity of the secreting cells, of the representatives of the three great classes of food-stuffs, proteids, fats, and carbohydrates, out of the comprehensive substance protoplasm."

Reasoning again from the strong analogy which must exist between human milk and cow's milk, and being aware of the great variations which occur in the latter, we may assume that human milk is liable to vary in its composition considerably with different milkings on the same day, and also with the milking of the same hours on different days; so that we at present are not in a position to state that our knowledge of human milk is sufficiently exact to justify an attempt to formulate a table to show the composition of woman's milk at different ages, however valuable such information may in the future prove to be. It is hardly within the scope of this article to discuss minutely the physiological question of the elimination of various elements by the mammary gland. The fact that

such elimination does, however, take place is conceded, and at times becomes of a good deal of importance in the management of the infant's diet. In the early days of the milk secretion we find a decided difference in the character of its composition.

From our knowledge of the colostrum period of cows, it would seem from analogy that the mammary gland in the first five or six days is, in part at least, an organ by which transudation from the blood can take place,—that is, that the colostrum period is one where the mammary gland has not yet reached the perfect development of its function for producing milk from its own cells, and that the milk of this early period is very deficient in casein and proportionately rich in albumen. Under these conditions, and also where, as at times is the case, the milk is abnormal from some defect in the health of the mother, causing the colostrum period to be prolonged or to recur, there seems to be a direct transudation from the blood of such inorganic elements as arsenic, antimony, lead, iodide of potassium, mercury, and others, taken by the mother. Well-authenticated cases also come to our notice from time to time, where injury has been done to the nursing infant in this way, and where even death has occurred from the elimination by the breast-milk of certain organic elements, such as colchicum and morphia.

We must also recognize the clinical fact that it is not merely when the milk is in a poor condition that this elimination takes place, but that it may occur at any time during the nursing period in the breasts of women who, so far as we can ascertain, are in a perfectly healthy condition. Thus every practitioner has at times doubtless observed the laxative effect on the infant of such drugs as the compound licorice powder given to the mother, and a case has lately come to my notice where a baby vomited for weeks while taking the milk from the breast of its mother, who was unusually strong and well, but who was in the habit of drinking a considerable daily quantity of porter, and where the vomiting ceased at once and did not return on the porter being omitted. That both the secretion and character of the milk are strongly influenced by the nervous system is a matter of common clinical experi-

ence, but the exact nervous mechanism which controls it has not yet been fully worked out; the clinical result, however, is admitted that emotional mothers do not make good nurses. The physiological facts concerning the changes which take place, according to the variation from the normal intervals of nursing, have an important bearing on the clinical management of the food. Thus, it is now well known that irregularity in nursing, too frequent nursing, and too prolonged intervals often so disturb the quality of the human breast-milk as to transform a perfectly good milk into one entirely unfitted for the infant's powers of digestion. Thus, too frequent nursings lessen the water and increase the total solids in human milk, making it resemble in a certain way condensed milk. This condition I have met with a number of times, and, as an illustration of its clinical significance, I would mention the case of a young primipara, healthy, vigorous, and with an abundant supply of breast-milk, who, under the advice of a physician, weaned her infant in two or three weeks because there were certain dyspeptic symptoms, at no time, however, of a serious nature. In this case it was afterwards ascertained that the infant had been nursed almost continuously day and night, the mammary gland having its function called upon with such frequent and abnormal intervals as evidently to have reduced the water in its secretion to a minimum and raised the total solids to such a degree that the infant was much more comfortable with its properly-prepared artificial food.

There is not much doubt but that the milk in this case, if it had been properly managed, would have agreed perfectly with the infant. On the other hand, too prolonged intervals result in such a decrease of the total solids as to render an otherwise good milk too watery and unfit for purposes of nutrition, however well it may be digested, as shown in the noted instance occurring in the summer of 1888, under my care, in Ward G, City Hospital, where a multipara had been nursing up to the time of entrance her infant, which was thriving. This patient stated that her milk had always been abundant and of good color up to the time of entering the hospital, when she was separated from her infant. At the end of twelve hours the breast was found to be so distended that the breast-pump

had to be applied. The milk was drawn with great ease, almost flowing of itself, and in considerable quantity, but it no longer resembled the milk of the previous nursings, which had been at the proper interval; on the contrary, it was clear, with very little color. The total solids were evidently reduced to a minimum, and it no longer would have nourished the infant. The following analyses, which will now be better appreciated after what has been written above, show not only the increase of total solids at the end of a nursing, but also that this increase is mostly of the fat and, to a lesser degree, of the albuminoids; they also show the difference resulting from longer or shorter intervals. Heidenhain explains this physiological phenomenon by saying that his investigations point towards the fact that during the pauses between the milkings the cells of the glands are growing, and a proportionately small amount of solids and large amount of water are secreted, while the irritation of milking causes increased activity of the milk-cells, with a corresponding increase in the solid secretion and lessening of the water.

ANALYSIS III.

Ass's Milk. (Peligot.)

	1st Portion.	2d Portion.	3d Portion.
Butter.....	0.96	1.02	1.52
Milk sugar.....	6.50	6.48	6.50
Casein.....	1.76	1.95	2.95

ANALYSIS IV.

Ass's Milk. (Peligot.)

	Milking Intervals, 1½ Hours.	6 Hours.	24 Hours.
Butter.....	1.55	1.40	1.23
Milk sugar.....	6.65	6.40	6.33
Casein.....	3.46	1.55	1.01

ANALYSIS V.

Cow's Milk. (Reiset.)

Time since last Milking.	Percentage of Solids at Beginning.	Percentage of Solids at End.
12 hours.....	9.33	16.04
6 hours.....	12.80	16.06
2½ hours.....	12.84	13.08

ANALYSIS VI.

Woman's Milk. (Harrington.)

	"Strippings," 2 Hours' Interval.	"Fore Milk," 12 Hours' Interval.
Total solids.....	15.32	10.14
Water	84.68	89.86
	<hr/> 100.00	<hr/> 100.00

With these chemical and physiological facts before us we are, while allowing the great clinical value of human milk analysis, forced to acknowledge that we must be most circumspect in the conclusions which we are authorized to deduce from such analyses of human milk as up to the present time have been made. We can also assume that an error in these conclusions, where a correct chemical analysis has been made, is less likely to occur from the sugar and ash than from the albuminoids and fat, and most likely of all, in both frequency and degree, in the latter. It may be further said, regarding the clinical value of milk analyses, that the mere microscopic examination of milk, beyond the determination of the presence or absence of colostrum corpuscles, is too uncertain and misleading to be in any way depended on, the chemical analysis being the only practical method which can be recommended.

As an instance of the truth of this statement I can cite the case of a physician skilled in the use of the microscope, who sent me from a neighboring town a specimen of woman's milk which he said was rich in fat. The microscope seemed to corroborate this opinion; but a chemical analysis by Dr. Harrington showed that the specimen contained only a little over one and a half per cent. of this ingredient. The presence of an undue amount of yellow coloring matter is also at times very misleading. Among a number of cases which I might speak of as instances of a desire to wean with insufficient cause, the following of considerable interest came to me in consultation early in July, 1888, and points towards the possibility of our, at times, being too hasty in our decision to deprive an infant of its mother's milk. The mother, a rather delicate primipara, twenty-five years of age, was delivered, July 3, of a boy seven pounds in weight. Within four hours puerperal convulsions set in, from which she recovered, but was left with albuminuria

0.25 per cent. and casts. The latter disappeared in a few days; but the albumen, though somewhat diminished, continued, and the patient, though naturally of a calm disposition, was in a highly nervous condition, fearing that she could not nurse her infant, and being decidedly opposed to having a wet-nurse. The milk appeared in considerable quantity on the fifth day; but the baby did not thrive, and although it gained somewhat in weight, was very fretful, slept very little, and looked badly, so that the attending physician became alarmed about it, and after treating it for its dyspepsia, without much success, until it was five weeks old, and finding that there was still about 0.25 per cent. albumen in the mother's urine, decided, on consultation with me, that the breast-milk should be withheld until we could determine the cause of the trouble, and an analysis was accordingly made with the following result:

ANALYSIS VII.

Fat	1.62
Sugar.....	6.10
Ash	0.17
Albuminoids	3.54
Total solids	<u>11.43</u>
Water.....	88.57
	<hr/> 100.00

This analysis revealing the probability that the large amount of albuminoids was causing the disturbance of digestion, and the small amount of fat was not sufficient for nutrition, the attending physician was very anxious to procure a wet-nurse; but while we were endeavoring to get a proper one we decided to empty the mother's breasts with the breast-pump every day, thus relieving her from the worry of attempting to nurse her baby and of seeing it fail to gain, and thus, also, giving her undisturbed nights and a great deal of out-door life. The infant was, in the mean time, given an artificial food, which was digested very well, and, as it ceased to cry, the mother became tranquil and the albumen in her urine in a few days was reduced to a trace. This treatment was carried out for a week, the milk continuing to flow freely, and an analysis was then made of the mother's milk, and also that of a healthy wet-

nurse who had been procured, and whose own baby was thriving on her milk, with the following results :

ANALYSIS VIII.

	Mother.	Wet-nurse.
Fat.....	3.20	3.04
Sugar.....	6.40	6.60
Ash.....	0.18	0.12
Albuminoids.....	2.52	2.32
Total solids.....	12.30	12.08
Water.....	87.70	87.92
	<hr/> 100.00	<hr/> 100.00

The two milks being equally good, it was then decided to allow the infant to begin to take one nursing daily from its mother, although the albuminoids were still about one per cent. higher than the infant was likely to digest. It was consequently given to its mother, nursed well, seemed satisfied, digested its meal without trouble, and at six months is still being nursed, and is healthy and well developed.

In connection with what has just been said about the breast-pump, the following case is also of interest :

During the past summer—June, July, and August—I had under my care a baby, seven months old, who was dying of starvation, as I had been unable to prepare for it an artificial food which it could digest and thrive on. This infant was also totally unable to nurse from the breast ; but the breast-milk of a wet-nurse that I procured for it agreed with it perfectly, and this nurse pumped the milk from her breasts and fed the infant with it from a bottle for over three months, with the greatest success, the infant thriving and now being in such a healthy condition that it is about to be weaned. This case shows the exceptional, but at times very great, value of the breast-pump.

(To be concluded.)

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Moizard: Intoxication by Cocaine. (*Rev. Mens. des Mal. de l'Enf.*, November, 1888.)

Intoxication by cocaine is still a comparatively rare accident, which justifies the publication of individual cases in which it occurs. The patient was a boy four years of age, to whom a maid gave a coffeespoonful of a twenty-per-cent. solution of cocaine, which was intended for external use, while he was suffering from an insignificant gastric disorder. The dose included twenty-five centigrammes of the salt. There was no immediate effect. The child was put in bed, and he fell asleep. Within an hour he awoke in great distress. His face was pale, his eyes haggard, respiration was difficult, sighing, and irregular. There was nausea, also profuse sweating, complained of violent pain in the upper portion of the chest, creeping feelings in the extremities, and also cramps in the limbs. A few minutes later there were phenomena resembling those of severe chorea, all the muscles being in motion. The pupils were widely dilated, the eyes showing decided nystagmus. The speech was short and interrupted, questions were answered, but there seemed to be a kind of intoxication, with hallucinations. The sensibility was intact, and the pulse was greatly accelerated. The child was seen by the author two hours after the symptoms began, and an emetic was administered. This was followed by an enema of fifty centigrammes of chloral hydrate. Vomiting continued nearly two hours, and then a second enema of thirty centigrammes of chloral was given. Three hours after the beginning of treatment the child became quiet and fell asleep; but his sleep was interrupted during the night by the choreic movements, which gradually became less violent. The next day there were only mild choreic movements, radiating pains in the limbs, and formication. In thirty-six hours after the beginning of the accident no trace of it remained.

Poisoning by cocaine has been particularly observed in connection with its use for anæsthetization of the cornea. It has caused destruction of the corneal epithelium, vesicular eruption of the cornea, and ulceration of the same. Also accidents of a more general character, nausea, vomiting, pain in the chest and extremities, general weakness, vertigo, sweating, and tremor. Though such accidents in ophthalmic practice are rare, they are

sufficiently frequent to demand caution in the use of the drug, for one cannot foresee that any individual may be unable to bear it. Cases of intoxication in consequence of subcutaneous injection of cocaine, or injection into the closed cavities, are not rare. Some of these are well authenticated and have been widely quoted. In most of them syncope, sometimes lasting several hours, has been the most prominent symptom. In none of the reported cases, with the exception of the author's, has intoxication been due to absorption through the gastric mucous membrane. Whatever be the way by which the drug enters the system, the effects are always the same, the cerebro-spinal and sympathetic nervous systems being especially affected in accordance with the dose which has been used and the susceptibility of the patient. In mild degrees of intoxication the effect is most noticeable upon the sympathetic system; swooning, vertigo, chilliness of the extremities, pallor of the face, profuse sweating, dilatation of the pupils, frequency and feebleness of the heart-beats being the symptoms which have been observed, and all of these are attributable to lesions of the sympathetic. If the dose has been large or the individual susceptibility marked, cerebro-spinal phenomena will appear in the form of trembling, extreme choreiform agitation, nystagmus, formication in the extremities, cramps, and trouble in inspiration, which may even amount to apnoea. There may even be difficulty in speech, loss of memory, slight delirium, transient coma, and hallucinations of vision. These symptoms are usually transient, but may be prolonged by frequent returns after short intervals. Only one fatal case has been recorded, that of Kolomonine, of St. Petersburg, in which twenty-four grains were injected into the rectum preliminary to curetting for cancer. Death came quickly after collapse, from which the patient could not be aroused, though excitants were used; even tracheotomy was performed, and oxygen introduced through the wound. The treatment should consist of excitants, such as inspirations of ammonia, stimulating friction, subcutaneous injections of ether; and also inhalations of nitrite of amyl, or suitable doses of chloral. The latter may be given either by the mouth or the rectum.

The physiological investigations of Richet and Langlois showed that the action of cocaine was that of a convulsivant. Equal doses being given, the effect is intensified according as the temperature is raised in the medium in which the experiments are being performed. Convulsive movements, of themselves, also raise the temperature of the animal experimented with, and this organic hyperthermia thus becomes a cause of increase of the convulsions; and unless prompt measures are

taken to check them, the animal dies from arrest of the heart and the respiration. From this point of view cold baths would seem to be of service in arresting the convulsions, and the poison would be slowly eliminated.

A. F. C.

Chappell, W. Franklin: Examination of the Throat and Nose of Two Thousand Children to determine the Frequency of certain Abnormal Conditions. (*Am. Jour. Med. Sciences*, February, 1889.)

The cases examined were taken from different sources, but principally from asylums and public schools. Of the 2000 examined, 1231 were suffering from some anatomical abnormality: adenoid growths, 60; enlarged tonsils, 270; deviated septa, 330; spurs on septa, 150; hypertrophy of inferior turbinated bodies, 260; hypertrophy of the middle turbinated bodies, 161.

Of those affected with adenoid growths, 49 were boys and 11 girls, the ages ranging from four to sixteen. Conditions of life and surroundings seemed to have no effect in the occurrence of the disease. Two classes of cases were observed; in one the growths were irregular red masses, varying in size from a pea to a small cherry, and having a tense, glistening appearance. They occupied chiefly the vault of the pharynx, secreted a copious, thick, yellowish mucus, and in some cases were covered with desiccated scabs. The vocal sounds were thick and dead, and nasal respiration at times impaired. No case of decided deafness, though ten had impaired hearing. All were of the scrofulous type, and the author thinks that this disease in such is due to diphtheria, scarlet fever, and measles.

In the second class the growths were small, pale, pink or gray in color, and, in some cases, presented a fringed appearance, in others were flat and round, and occurred singly or in clusters. Six were affected severely, 19 in a moderate degree. The 6 severe cases had complete nasal obstruction, the "dead" voice, impaired hearing, hypertrophied tonsils, small nostrils, pigeon breast, and were of a restless, irritable condition. Nineteen had these symptoms, but in a moderate degree, and only 2 had impaired hearing. In all the mucus was white and frothy, but very copious. The author thinks these cases hereditary.

Of those suffering from enlarged tonsils, 183 were of both tonsils and 87 of one only; 160 cases were males, 110 females. All breathed with the mouth open, and presented other symptoms of obstruction.

Of deviated septa, 270 were of the cartilaginous, 50 of the bony, and 10 of both. Of the cartilaginous, 148 were to the

right, 122 to the left. Of the bony, 35 to the right, 15 to the left. The bone and cartilage deviations were S-shaped. The cases were fifty per cent. more numerous in boys than in girls. Twenty-five per cent. gave history of injury, and same number were due to hypertrophy of middle turbinated bone. Only 10 cases occurred under seven years of age, and were due to injury. In thirty per cent. respiration was impeded, and in all there was increased nasal discharge.

Of spurs on septum, 100 were on the right side and 50 on the left. In 25 of the older children the deformity was quite marked, occluding the nasal passage, and causing frequent attacks of epistaxis. The author thinks these spurs are due to slight injury, and though small at first, rapidly grow. Of the 260 cases of hypertrophy of the inferior turbinated bodies, 102 were bilateral and pressed the septum on both sides; 140 were unilateral, occurring chiefly on the left side, very large, often occluding the nostril and pressing the septum to the opposite side; in 18 the hypertrophy of inferior and middle turbinated bodies was so great as to completely fill the nasal cavities. The cases were about equally divided between males and females, but were rare in very young children. Of the 161 cases of hypertrophy of middle turbinated bodies, 51 were bilateral and 110 unilateral. The bilateral were chiefly an hypertrophy of the mucous membrane, but in the unilateral there was mostly a bony hypertrophy; and in 75 of these cases the septum was deviated to the opposite side. No case presented any reflex symptoms.

From the study of these cases the author draws the following conclusions: Enlarged tonsils and adenoid growths are the only anatomical abnormalities that could be classed as belonging to very early life. The other abnormalities are acquired, usually after the age of six, and increasing with each year till puberty. All social classes are equally liable. Males suffer more frequently than females, probably from greater exposure.

Hauser: The Therapeutic Value of Lipanin. (*Jahrb. f. Kinderh.*, xxix. 1.)

The author reports the experience which he has had with lipanin in dispensary practice. It was given in small doses after meals, the dose ranging from one to three teaspoonfuls three or four times daily. It was used with thirty-eight children, ranging in age from fifteen months to thirteen and three-quarters years, for anæmia, chorea, rachitis, chronic tuberculosis, and scrofula, or during convalescence after acute febrile diseases, typhoid fever, and diseases of the digestive organs. The observations and experiments showed that it was usually

taken with less repugnance than cod-liver oil, many children taking it without objection, especially if something be given to remove its taste. A peppermint lozenge or a piece of dry bread may be given for that purpose, and menthol may be used in cases of tuberculosis in the proportion of five grammes to one hundred and fifty of lipanin. All patients increase in weight under its use except those who have hectic. The lipanin may be combined with different medicaments or with olive oil, mayonnaise, sauces, and salads. In the author's experiments it was well tolerated by patients who could not bear cod-liver oil even in small doses, and by those whose digestive organs were weakened. Patients with anæmia, chorea, and rachitis rapidly increased in weight under its use. In the chronic wasting diseases, especially in phthisis pulmonum, it was remarkable to see the favorable influence which was produced in the majority of cases upon the nutrition and upon the general condition. In those who had already become convalescent there was great increase in weight, while healthy children were not perceptibly influenced by its use. Lipanin was absorbed in these investigations to an extraordinary degree. The volume of fats and fatty acids recovered with the stools during its use varied within very narrow limits. The maximum of fats was .736 per cent. and of fatty acids .814 per cent. In children under six years of age the quantity given was half a teaspoonful to a teaspoonful three times daily. One should begin with small doses, and gradually increase them, first giving them after meals, and finally before meals. Lipanin may also be given in hot weather without difficulty and with good results. The preparation of lipanin malt extract, consisting of one part lipanin to two of malt extract, is a very useful one and is readily taken by children.

A. F. C.

II.—MEDICINE.

Hellström: Lobar Pneumonia in Children. (*Jahrb. f. Kinderh.*, xxix. 1.)

The most recent medical literature pays comparatively little attention to the subject of lobar pneumonia in children, though Ziemssen, Lahmen, Jürgensen, Thomas, and others, have by no means ignored the subject in their writings. The author considers three varieties of the disease,—1, a pectoral; 2, a gastric; 3, a nervous or cerebral. The crisis in pneumonia of the lower lobe occurs in the second half of the first week; in pneumonia of the upper lobe in the end of the first or the beginning of the second week. If several of the lobes are involved, the crisis

may be delayed several days. Thirty of the author's cases are subjected to a careful analysis in his paper. More than half of these occurred during the months of April and May. Of the thirty cases, seventeen occurred in girls and thirteen in boys, and their ages varied between fifteen months and eleven years. Most of them were in good health and well nourished and developed prior to the occurrence of the pneumonia. Some of them had suffered at previous periods with measles or varicella, some had cough or diarrhœa immediately before the pneumonia. The disease began suddenly and violently, the first symptoms being chill, fever, cough, loss of appetite, vomiting, diarrhœa, pains in the side, and convulsions. The cause was attributed in some cases to taking cold, in others to the use of cold drinks, but in most of them the parents could assign no cause. Fever was present in all cases, and usually remained high until it descended, either suddenly or gradually, to the normal. The pulse was also increased in rapidity in all cases, in one case reaching one hundred and eighty. In those patients who were under five years of age it varied between one hundred and sixty and one hundred and sixty-eight, in those who were over five between one hundred and twenty and one hundred and sixty. Respiration in the very young reached as high a limit as seventy to eighty per minute; it was in many cases more than forty, but this did not seem to indicate a bad prognosis, according to Baginsky's rule. No fixed relationship between pulse and respiration was present in all cases. It was thought that this was not more singular than the same irregularity which often obtains during health. The disappearance of the fever usually took place during the night, and was frequently followed by profuse perspiration. The crisis lasted about twelve hours in most cases.

The right upper lobe was involved in twelve cases, the right lower lobe in four, and the entire right lung in one. This leaves six each for the upper and lower lobes of the left lung and one for both lobes of the left lung.

Percussion and auscultation showed nothing different from that which occurs in the pneumonia of adults. Pleurisy was a complication in four cases, diarrhœa in only one case. Convulsions in the course of the disease also occurred with several. The same cyclical course to the disease was observed as is seen in adults. Bacteriological investigations were not made for the reason that children do not discharge their sputa but swallow them. No contribution to pathological anatomy could be made from this analysis, only one case being fatal. During the febrile period the quantity of urine discharged was lessened and its specific gravity increased; after the disappearance of the

fever the urine returned to its normal condition. Albuminuria was rarely seen and it was never intense. In many of the cases acetone and acetic acid were present during the febrile period. Jaksch does not regard the presence of acetic acid in the urine of children during febrile processes as of bad prognostic significance. The loss of weight during the febrile period varied between .10 and .35 kilogramme. The prognosis in lobar pneumonia may be considered uniformly good; none of the cases in this series was fatal. As to treatment, antipyretics, especially thallin and antipyrin, were given when the temperature was high. Plenty of air and carefully-regulated diet were also provided. If the cough were severe urethan and antipyrin were prescribed, and alcohol was given when stimulants were indicated.

A. F. C.

Guaita: The Frequency of Lobar Pneumonia during the First Two Years of Life. (*Arch. f. Kinderh.*, x. 1.)

There has been great difference of opinion among writers upon diseases of children as to whether lobar pneumonia is of frequent occurrence among children one and two years of age, Valleix and Barrier maintaining that such is the case, and Parrot, Goffroy, Cadet de Gassicourt, and others affirming that the pneumonia in children under two years of age is always of the catarrhal variety. During the past ten years the author has seen one hundred and eighty cases of pneumonia, of which one hundred and thirty occurred in children one and two years of age, and in forty-five of that number there were symptoms which were quite characteristic of croupous pneumonia. The author therefore coincides with the statement of Carron de la Carrière, that croupous pneumonia in early childhood is much more common than has usually been supposed. In none of the author's forty-five cases was there a fatal result, so that his diagnosis could not be verified by post-mortem examination, notwithstanding he believes the question, whether a differential diagnosis between catarrhal and croupous pneumonia can be made during life, should be answered in the affirmative. The phenomena of outbreak and of continuance of the two forms of disease, as well as the temperature-curves, show decided differences. Croupous pneumonia almost always supervenes upon a state of complete health, beginning with a chill, the temperature rising in a short time to 40° C., and in severer cases to 41° C. It may become lower than this for periods lasting a few hours each, but continues high most of the time during several days. When convalescence begins the temperature suddenly falls. Percussion and auscultation show the peculiar conditions of croupous pneumonia during the first

twenty-four hours of the disease. In the greater number of cases only one lung is attacked, and the apex is usually involved. Catarrhal pneumonia, on the other hand, usually comes to children who are already debilitated by a precedent severe disease,—bronchitis, for example,—and the symptoms may appear gradually, probably in the course of two or three days. It may even be five or six days before circumscribed areas of dulness can be made out, and auscultation may reveal a variety of murmurs. Both lungs are usually involved, especially in the lower and lateral portions. There is no rule as to the temperature-curve, and defervescence occurs by lysis. The author concludes that in all cases of acute lung-disease, in which the fever increases rapidly and defervescence occurs by crisis in five to seven days, the condition is croupous pneumonia. A. F. C.

Owen, S. Holgate: Prognosis of Mitral Disease in Children. (*Med. Chronicle*, February and March, 1889.)

Rheumatism and chorea are most frequently the cause of valvular disease. The author does not agree with those who hold that the prognosis is generally equally highly favorable for valvular disease having its origin in rheumatism and chorea in early life. The prognosis of lesions produced by rheumatism are more grave than those produced by chorea. Rheumatism affects the valves more, and often is accompanied with disease of the cardiac muscle and inflammation of the pericardium. So long as chorea is uncomplicated by rheumatism the mitral affection is almost always slight and transitory.

The author reports seven cases for the purpose of illustrating his assertion. In his experience, the severity of the choreic movements, frequency of occurrence, and duration of attacks have no relation to the severity of the heart mischief.

Scarlatina, measles, pulmonary diseases, and anæmia are considered with reference to the production of endocarditis. Of these, only scarlatina is to be especially feared, and this partly on account of its tendency to be associated with rheumatism and acute renal diseases. Compensatory changes in every form of mitral disease are more effectively produced in early than in adult life.

Hochsinger: Some Peculiarities in the Phenomena of Auscultation of the Heart and Great Vessels during early Childhood. (*Rev. Mens. des Mal. de l'Enf.*, January, 1889.)

According to the author, the inorganic *bruit de souffle* of the heart, which is also called the accidental *bruit de souffle*, is absent during childhood until the second half of the fourth

year of life. This fact is the more surprising as the circumstances which habitually call forth these sounds in adults are met with in early childhood with much greater frequency and more marked intensity. The author has examined several hundred children under three years of age, with the view of determining the question as to the presence or absence of these sounds, and he did not find them present in a single case. Though in several of these cases there were evidences of extreme anæmia, in all of them the sounds of the heart were always clear, sharp, and well defined. Of twenty-four very anæmic children who had passed the third year, only eight presented evidences of the accidental murmur. Of twenty-nine children who had suffered from attacks of scarlatina, diphtheria, pneumonia, phthisis, etc., in four cases only could a systolic murmur be heard at the level of the valves, and the youngest of these was five years of age. The author believes that it is not until after the sixth year has passed that the signs furnished by auscultation of the heart have the significance which they have in adults. If that is true, every systolic murmur which is heard in very early childhood is of great diagnostic value, for it indicates with certainty a lesion of the pericardium.

A. F. C.

• Money, Angel: Mediastinal Sarcoma. (*British Med. Jour.*, November 10, 1888.)

Dr. Angel Money showed to the Pathological Society of London a specimen of mediastinal sarcoma in an infant aged fifteen months. It was the size of a man's fist and projected chiefly into the right side of the thorax. It was one-fourth the size of the thoracic cavity, and caused extensive collapse of the lungs. It pushed the heart, aorta, and vena cava in front of it, and displaced the liver downward. It did not grow from the vertebræ, and the spinal column was not eroded. During life the symptoms resembled those found in extensive collapse of the lung; the physical signs were extreme dullness of the right lower half of the chest, with absence of breath-sounds; elsewhere bronchitic râles obtained. An exploring needle thrust into the dull area felt as if held in a dense solid tissue; no fluid could be withdrawn. Microscopic examination proved the tumor to be a round-celled sarcoma without any striated muscular tissue.

Swanzy: Conjugate Deviation of the Eyes from Congenital Lesion. (*British Med. Jour.*, November 17, 1888.)

The patient was a healthy child, one year old. Both eyes were turned to the right, but could be turned to the left, yet

not as far as the canthus. The effort was attended with nystagmic motions. The associated action of the interior was unimpaired. Vision was good and ophthalmoscopic appearance normal. After birth the child had not opened its eyes for four days, and there was marked nystagmus in all positions of the eyes. The mother said that the child had a fall on the right side of the head when six months old, but this was not followed by any head symptoms. Mr. Swanzy regarded the case as due to the intrauterine lesion situated in the pons and implicating the nucleus common to the sixth and third nerves on the left side. Probably the lesion was at first an irritative one, and caused the nystagmus for the first two months, and then it passed on to destruction only in such a degree as to lame without absolutely paralyzing the left nuclear centre for the third and sixth nerves. This seemed to be the only recorded case of congenital conjugate lateral deviation.

Warden, Charles: Congenital Ear-Disease. (*British Med. Jour.*, September 1, 1888.)

The child, aged now two and a half years, was of strumous aspect, nervous, and generally anæmic. During pregnancy the mother was in a low nervous state, and frequently suffered from neuralgia affecting the left facial nerve. After birth the child was fretful, nervous, irritable, and evidently suffering from pain. About the time of teeth-formation a discharge from the left ear appeared. This was followed by convulsions and facial paralysis of the left side. The discharge grew more purulent and offensive. A large abscess developed back of the ear, and it was opened. Diseased bone was evident. Later some pieces of dead bone were removed from the meatus. The discharge from the ear now diminished, and all the symptoms began to improve. The paralysis disappeared, but some otorrhœa remains. Dr. Warden is of the opinion that in this case a low form of inflammatory action was going on from birth. The child was treated on the tonic plan, with all the nourishment it would take.

Railton: Cerebral Tumor. (*British Med. Jour.*, November 10, 1888.)

Dr. Railton showed to the Manchester Clinical Society a boy, aged five years, with double optic neuritis, staggering gait, increased knee-jerks, and ankle clonus. The disease had apparently commenced six months before, when he began to complain of frontal headache, to suffer from vomiting at irregular times, and to stagger and fall when walking.

While under observation the boy had become entirely blind, and was unable to walk without assistance. Though there was no actual paralysis, there seemed to be general loss of power.

There was no nystagmus, no sensory defect or loss of intelligence, and the chest and abdomen appeared to be free from disease. Two attacks of unconsciousness had occurred with tonic spasm, affecting the limbs on both sides, and followed by retraction of the head.

Dr. Railton thought that there was a cerebral tumor, probably tuberculous, occupying a central position, and pressing forward so as to interfere with both motor tracts.

Bischofswerder: Primary Pseudo-Membranaceous Rhinitis. (*Arch. f. Kinderh.*, x. 2.)

The author thinks that the reason why cases of this disease have been so seldom reported is that it has usually been overlooked. The anatomical changes in the nose in this disease are the same as those which occur in the analogous disease in the larynx. Virchow was the first to define croup and diphtheria with precision, in 1847, and he divided all the superficial inflammations of mucous membrane into catarrhal, croupous, and diphtheritic. In the catarrhal form the quantity of nutritive plasma occurring upon the surface is increased. The cell formation is richer than normal, but the cells are pushed aside and removed by the underlying layers before they have reached a normal condition of development. The more chronic the catarrh, the less numerous and the better developed are the cells; the more acute the catarrh, the more numerous and less well developed the cells. Croup means an affection in which a false skin or membrane is developed and overlays the mucous membrane. It is yellowish-white in color and is composed of coagulated fibrin and pus-corpuscles. When this is removed a normal or perhaps hyperæmic mucous membrane is found underneath, but there is no ulceration and no resulting scar. Diphtheria is a process which occurs in the mucous membrane. A new membrane appears at its surface, but it is not a false membrane, being composed of a necrotic portion of the mucous membrane. When this is removed a diphtheritic swelling still remains. Croup has a predilection for the larynx and nose; diphtheria for the pharynx. A pure laryngeal croup—that is, one which runs its course primarily and solely in the larynx, and has not attached itself to diphtheria of the pharynx—is a rare occurrence. Croup of the nasal mucous membrane usually occurs secondarily in the course of pharyngeal diphtheria, the process extending earlier or later in the

disease to the pharyngo-nasal cavity and thence to the nasal cavity; or it may extend from the anterior side of the uvula and the borders of the soft palate to the posterior area, and thence to the nasal mucous membrane. Diphtheria seldom begins with a croupous disease of the nasal mucous membrane, and only by degrees reaches the pharynx. More rare still is a croup which is limited entirely to the nose. The latter condition was first described by Schuller. A second case was described by Henoch in 1883, and in 1888, Hartmann described six additional ones, Seiffert three, and Moldenhauer four. The author adds the histories of two more, and these show that the disease is characterized by a fibrinous exudative inflammation, which is primary and almost isolated in the nasal mucous membrane. Its clinical course would seem to indicate that it is an exaggeration of an ordinary acute catarrh of the nasal mucous membrane, and not a specifically croupous inflammation. The etiology of the disease is that of acute cold in the head, children being affected by preference. This is probably due to the susceptibility of children to all inflammatory diseases of the mucous membrane. Scrofulous children are more susceptible to it than others. It occurs usually during moist, cold, and changeable weather,—that is, in the spring and fall. It is sporadic rather than epidemic, and non-infectious. At the beginning of the disease the phenomena are those of a severe acute coryza. There is fever at this stage and an abundant secretion, the mucous membrane being red and swollen. As it progresses the obstruction in the nose is very pronounced, and may lead to a dangerous condition or even a fatal result. The dryer the false membrane is the greater will be the difficulty of its solution or removal. It may be in one or in both nostrils, and may cover the entire area of mucous membrane or only a portion of it. A muco-purulent discharge may continue to the end; but there is not the tendency to decomposition and foul odor which accompanies nasal diphtheria. The membrane may be renewed within twenty-four to forty-eight hours after it has once entirely disappeared. In most of the reported cases the pharynx and pharyngo-nasal cavity have not been involved in the disease. The prognosis is usually good, excepting in very young infants. The treatment consists mainly in the removal of the membrane, having first softened it by the spray of a suitable solvent. A. F. C.

Pott: Etiology of Vulvo-Vaginitis in Children. (*Anales de Obst. Ginecop. y Pediat.*, October, 1888.)

During the past twelve years the author has seen eighty-six cases of vulvo-vaginitis in children. In fifty-six of the cases

the patients were under five years of age; in twenty-three they were from five to ten; and in seven from ten to fifteen. He believes that the disease is a specific transmissible one.

Czerny and Isreal have found gonococci in the secretions of the disease. The etiology of the disease is not clear in all cases; in some of them, however, there was a history of rape. In a few cases there was evidence that infection occurred at birth. In many cases in which the children were from two to four years of age there was evidence that they had slept in the same bed with fathers or brothers who had gonorrhœa, and infection may have occurred from contact with the soiled bed-clothes. The author formerly believed that vulvo-vaginitis was a symptom of syphilis, but he had seen it continue after the syphilis had apparently been cured. Prochowink had seen twenty-one cases of the disease, had found gonococci in seventeen, and in these cases the fathers of the children were affected with gonorrhœa. Sünger had seen two cases in which fathers had gonorrhœa, and also their children, aged respectively one and three years.

A. F. C.

Finlay: Remarks on a Case of Bronchiectasis. (*British Med. Jour.*, October 13, 1888.)

A boy, aged ten years, had been sick about two years. There was a family history of phthisis. On examination there was flattening of the right side of the chest, deficient movement, and well-marked retraction of the intercostal spaces during respiration. The breath-sounds in front, on the right side, were cavernous above the second and below the fifth rib. In the intermediate region tubular breathing and everywhere accompanied with bubbling râles. In the anterior axillary region there was cavernous breathing and whispering pectoriloquy. Posteriorly over the lung there was tubular breathing, bronchophony, whispering, pectoriloquy, and moist râles. The breath was extremely fetid, together with the sputa, which was copious and purulent.

Just internal to the angle of the scapula, one and one-half inches of the eighth rib was removed. The plural surfaces were not adherent, and the lung was therefore stitched to the chest-wall. The lung was incised and a drainage-tube put in. Only a little blood-stained pus exuded. There was some temporary improvement.

On the tenth day there was some hemorrhage from the wound, and some blood was coughed up; but although he became blanched he recovered from this. He died from exhaustion two weeks after the operation. Post-mortem examination showed that the wound led into the right lower

lobe and also opened the plural sac. A small piece of bone was found in the main bronchus leading down to the lower lobe. The upper lobe was collapsed and contained two small gangrenous areas; the bronchi were dilated.

The middle lobe was collapsed and its bronchi dilated. The bronchi of the lower lobe were dilated so as to occupy most of the lobe. They were filled with fetid secretion. The portions of lung intervening between the dilated tubes were in a state of chronic pneumonia and induration from fibrosis. A large bronchiectasis had been opened and drained by the operation. The author has collected the records of twenty-two cases of bronchiectasis in which incision of the lung has been practised.

The results have been the following: four cured, three relieved, and fifteen have died within varying periods after operation.

The severe hemorrhage occurring in this case, although not usual, has been observed in several of the cases referred to.

The author thinks that in his case hemorrhage was due to the pressure of the end of the drainage-tube against the wall of a branch of the pulmonary artery which had given way.

The author holds that the operation is justifiable in all cases like the present one.

Legroux: Infantile Polyadenopathy. (*Le Concours Méd.*, August 18, 1888.)

At the recent Paris congress for tuberculosis the author called attention to the small glands which were sometimes localized in the neck of children and were attributed to the lymphatic diathesis. Almost all children who live amid unhealthy surroundings and bad hygienic conditions present these phenomena. The author gave the name micro-polyadenopathy of childhood to this lesion, which consists of small glandular accumulations without inflammation, without adhesion to the skin, and freely movable upon the deep tissues. The question arises, whether these glandular enlargements are the consequence of erosions or of traumatisms, such as are common among children, and is answered in the author's statement that they are the evidence of true tubercular infection. With this local trouble one generally observes, in addition, a general organic disturbance; in other words, the lesion may be considered the primary manifestation of tuberculosis. The case of a child is narrated, in which the enlarged glands were present, though the general condition of the child seemed good. A few months after the lesion was discovered the child died of tuberculosis.

Daremborg has observed this lesion in a number of cases

existing coincidently with infectious tubercular amygdalitis. Children may contract this condition from tuberculous parents. The tonsils in such cases are swollen and covered with a kind of coating, in which the bacillus tuberculosis may be found. For treatment in such cases it is advised that antiseptic washing of the tonsils be systematically practised. A. F. C.

Grancher: Spleno-Pneumonia in Children. (*Le Concours Méd.*, November 3, 1888.)

This disease was described by the author in 1888 as a pulmonary affection showing the signs of pleurisy, and therefore always confounded with it. The name spleno-pneumonia was first used by Joffroy to define one of the forms of broncho-pneumonia. The definition which the author gives is included in the following quotation: "Between the simple pulmonary congestion, a type so well described by Woillez, and frank lobar pneumonia, apart from broncho-pneumonia, there is a morbid condition of the lungs, a kind of subacute pleurisy, which simulates pleurisy with an average quantity of effusion, and merits a particular description and denomination." The name spleno-pneumonia is considered more appropriate than that of pseudo-pleuritic pulmonary congestion, which was given to this condition by Dreyfus-Brissac; but the first part of the term does not refer to the spleen, but to a condition of splenization which is present, in which condition there is an exudation which is less fibrinous than that which obtains in lobar pneumonia. The phenomena are in general those of pleurisy, but certain distinctive signs enable one to make the differential diagnosis. In the place of pure ægophony the ear usually observes in spleno-pneumonia vocal vibrations which are a little more confused, obscure, and of a higher tone than in pleurisy; in a word, there is broncho-ægophony. Bourdel and Queyrat have related cases, however, in which there was typical ægophony. At the end of inspiration in spleno-pneumonia one often hears very small, dry, discrete crepitations disseminated through foci of moderate extent, but very abundant in such localities. These may persist ten or fifteen days.

In pleurisy, as the lung floating above the effusion becomes condensed, the vocal vibrations appear suddenly and in abundance above the line of dulness. In spleno-pneumonia the transition is gradual from the region of no vocal vibrations to that in which they are present.

In spleno-pneumonia of the left side Traube's space is usually preserved, while it is effaced in pleurisy of that side. It is by grouping these signs that one is enabled to exclude pleurisy

and diagnosticate spleno-pneumonia. If uncertain, an exploratory puncture will remove all doubts. In addition to the signs mentioned, Queyrat has also referred to absence of deviation of the sternum, and displacement of the heart, as occurring in spleno-pneumonia.

A. F. C.

Robin: Clinical Urology of Variola. (*Gaz. Méd. de Paris*, September 29, 1888.)

This question has never yet been treated systematically. Gubler long since showed that the urea is notably increased at the beginning of variola; and this fact may be utilized in the diagnosis of doubtful cases, since the urine in typhoid fever, measles, and scarlatina never gives a precipitate of nitrate of urea when nitric acid is added. The author has found that in most cases in adults the urea during the initial stage of variola was twenty-eight to thirty grammes per twenty-four hours. Should variola supervene in the course of convalescence from an acute disease, it would be equally marked by azoturia. This symptom is not permanent, however, but is present only during the first days of the disease. It is not a constant sign, and may also be present in certain other febrile conditions, as in gastritis, pneumonia, intense bronchitis, and facial erysipelas. The increase of urea is less marked in severe than in mild cases of variola. The quantity of urine in the early period of variola is diminished, while its density is increased. The chlorides may be diminished to one gramme daily during the period of invasion, while they increase to two or two and a half grammes during the period of suppuration. When the urea becomes diminished the chlorides may increase to eight, ten, or fifteen grammes. Phosphoric acid is increased during invasion, both in children and adults, is further increased during suppuration, is suddenly diminished with the diminution of fever, and reaches its normal status only when the patient begins to be nourished normally.

According to Maragliano, if the chlorides and the phosphates disappear entirely the prognosis becomes bad. The sulphates are slightly increased as the disease progresses. The author confirms the statement of Becquerel, that uric acid is increased during the first stages of the disease, and gradually diminishes after suppuration has been instituted, except in rare cases, when it increases, and constitutes a critical phenomenon. Frerichs has found valerianic acid in the urine of variolous patients; Emminghaus has found fatty acids, and Hoppe has found leucine and tyrosine. The liquid and non-crystallizable extractive matters are increased in this disease. In hemorrhagic variola they constitute the greater portion of the

organic matter of the urine. Ponchet has obtained from them a liquid ptomaine of great toxicity. Indican is increased in the severe forms of the disease. The precipitates of urine in this disease are composed of uric acid, urate of sodium, pigmented cellular *débris*, white blood-corpuscles, and filaments of mucus. The lower layer of the precipitate may consist of urate of ammonium. Albuminuria is much rarer in variola than in typhoid fever, but the author has recognized it in four varieties.

1. Pre-variolous albuminuria, which is of grave import if the albumen is abundant.

2. Transitory albuminuria, which is not strongly marked, and appears at the beginning of the eruption and of suppuration.

3. Abundant albuminuria, which may follow the acute period at any time. It occurs as a complication in connection with the severer forms of the disease.

4. The albuminuria of convalescence, which is of two varieties, the first following or preceding the febrile periods of convalescence, and due to abscess, parotitis, etc., also being transitory and without serious prognostic significance, the second being analogous to scarlatinal nephritis, the anatomo-pathological characters of which have been described by M. J. Renant, of Lyons. From his description it would appear that the nephritis is interstitial and fatal in its consequences.

A. F. C.

Schoppe: *Choleriform Enteritis in the New-Born Infant, and its Treatment*. (*Rev. Mens. des Mal. de l'Enf.*, May, 1888.)

Abundant serous discharges, however important they may be from a symptomatic stand-point, do not suffice to account for collapse. The latter has decided analogies to traumatic shock, and is produced under the influence of an abnormal afflux of blood to the digestive organs, to the detriment of the other parts of the body. On the other hand, the phenomena of fermentation and other morbid processes which may take place in the intestine would produce an effect upon the splanchnic nerve, abnormal excitation of which would lead to temporary paralysis of other nerves. The treatment devised by the author is based upon the foregoing statements, the object being to draw the blood to the skin so as to relieve the abdominal organs. With this end in view, the body is to be entirely enveloped in moist cloths according to the method of Priessnitz, to diminish the heat of the body. This should be repeated every two or three hours. When the wrappings are

cold they act as nerve-excitants and favor circulation and respiration; if warm, they produce derivation and regulate the circulation. If phenomena of collapse are present, mustard baths at a temperature of 35° to 40° C. for ten or fifteen minutes are indicated. One may also give ten or twelve drops of cognac, or rich wine, or tea with cognac. For the vomiting and diarrhoea opium may be given if the heart is sufficiently strong to warrant it.

A. F. C.

Vineta-Bellaserra: Erythema in the Newly-Born. (*El Prog. Gin. y Ped.*, September 25, 1888.)

Erythema is a very common disease during the first period of life. The disease consists in the presence of vesicles with a red areola, which are present in great numbers upon the diseased surface. As contiguous vesicles rupture they become fused into more or less extensive patches. If the general condition of the child is good, healing of these patches will rapidly take place, the redness will disappear, and there will be in conclusion only a slight epidermic desquamation. The course of the disease is very different in cases in which a constant irritation is kept up; as, for example, when the skin of the nates is constantly irritated by fecal discharges. Such irritations undoubtedly give rise to much pain. Parrot believed that the disease was most frequently situated in the nates and posterior portions of the thighs. It may extend, however, to the trunk and head. This is not an independent affection, and is only encountered in connection with the condition known as athrepsia. Two conditions are essential to its development,—one is that the child should have diarrhoea, and the other that the portion of the skin which is involved should have already been subjected to an irritation of some kind; in other words, the nutrition of the skin must be altered and impoverished. With some children this affection is a trivial matter, with others it is attended with great swelling of the labia majora or scrotum, with intense redness of the surface, or with the development of papules. According to its intensity it may last a few hours or many days, and when it disappears no scars are left, in which respect it differs decidedly from syphilis. The eruption is sometimes confounded with that of variola, but it must be remembered that the latter disease is rare in new-born infants. Erythema is not accompanied with hyperthermia, like variola; on the contrary, the temperature is rather lower than normal. Athreptic children who suffer with variola may also have a normal or sub-normal temperature, and the diagnosis in such cases will be uncertain until umbilication of the pustules has occurred. Erythema

which is due to sweating is confined to the trunk and head, it is also without the intense redness which accompanies the erythema of the new-born. The roseola of vaccination may be distinguished by the fact that it has patches of paleness distributed over the upper limbs and head more than upon the lower limbs. The patches of syphilis have a coppery color which is distinct from the intense red of erythema, and the former end in a perceptible depression of the skin which is not found in the latter. Erysipelas in the new-born usually begins at the umbilicus; the skin also has a harder feel than it has in erythema, unless there is in the latter more or less of œdema. Erythema may be differentiated from muguet in the fact that the latter is located upon the mucous membrane of the mouth; the causes of the two are also entirely different. It is the *rete mucosum* that is involved in erythema, while in syphilis it is the *derma*. The general treatment is that of athrepsia; locally one should use absorbent powders, like lycopodium; or, if there is ulceration, applications may be made of naphthaline, iodoform, or a five-per-cent. solution of aseptol.

A. F. C.

III.—SURGERY.

Pollard, Bilton: Three Successful Cases of Suprapubic Lithotomy in Young Boys. (*British Med. Jour.*, January 12, 1889.)

The first case was aged ten. On admission the urine was muddy, of offensive odor, and alkaline reaction, with a sediment of mucus and pus. After washing the bladder for five days with boracic acid lotion, the urine being acid and clear but still containing pus, and a stone being distinctly felt, the operation was performed.

The rectum was distended by a Barnes's bag, and the bladder filled with a boracic lotion. The incision was made in the middle line, just above the pubis. The bladder was raised and steadied by two silk ligatures passed through its wall, and incised in the middle line between the ligatures. The calculus was easily extracted by lithotomy forceps. The wound in the bladder was closed by fine catgut sutures inserted through the muscular coat only. The recti muscles and skin were sutured by catgut.

The urine was drawn every four hours. None escaped by the wound till the fourth day. The stitches were then removed and the wound left to heal by granulation. All the urine passed by that channel for a week, when some began to pass by the urethra. At the end of six weeks all the urine

was passing by the urethra. A small sinus was easily closed by scraping. The calculus weighed two hundred and fourteen grains.

The second case was aged eleven. Symptoms of stone had been present for a year. The pulmonary treatment and the operation were in all respects similar to the preceding case. Urine began to pass through the wound on the third day, but six weeks after the operation was passing entirely by the urethra. The incision healed perfectly. The calculus weighed three hundred grains.

The third case was aged seven. Symptoms of stone had been present two years. The operation was similar to that of the preceding cases except that silk sutures were employed. A soft rubber catheter was tied in the bladder. The urine flowed from the wound, however, on the third day. Healing of the wound was perfect but slow as in the other cases. The calculus weighed two hundred grains.

The rectal bag used in each case did not appear to raise the bladder. It was so thoroughly raised by distention, however, that the incision could be made without exposing the peritoneum. Though the attempt to obtain primary union was not successful, the closure of the wound during the first three days was beneficial, as the loose connective tissue had become solidified by inflammatory exudation before exposure to the irritating action of the urine.

Thomas, Howell: Eczema partly cured by Vaccination. (*British Med. Jour.*, January 19, 1889.)

The child was covered by the eruption from head to foot. He was treated by the author for six months without success, and after two years returned unimproved. He was then vaccinated with calf lymph in four places and all treatment stopped. Within two weeks there was slight improvement, and at the end of three months decided improvement.

The author does not hold that vaccination is a cure for eczema, but considers it worthy of trial in obstinate cases.

Paterson, Melville: Congenitive Diaphragmatic Hernia. (*British Med. Jour.*, December 1, 1888.)

Classified according to the mode in which the hernial sac is formed, there are three varieties:

1. Due to defective formation of the diaphragm. Total absence of the diaphragm is very rare; partial absence more common. The rupture is usually unilateral.

2. Occurring through one of the natural openings. Extremely rare, the œsophageal opening being usually involved.

3. Due to distention of the diaphragm. This also is rare.

A case is reported which had died in less than an hour. The child did not breathe or cry, but made gasping motions accompanied by heaving movements of the chest with some depression of the epigastrium. The heart beat vigorously for half an hour, but gradually became feeble till death occurred. Externally no lesion or deformity was visible. The left half of the diaphragm was found to be wanting, and the thorax was filled with the abdominal viscera. The lung was unexpanded and compressed in the upper part of the chest cavity. The pleural sac was continuous with the abdominal cavity. The case was of chief interest from an anatomical point of view, as it elucidated several points concerning the development of the diaphragm.

Lane, W. Arbuthnot: The Causation of several of the Simple and Rachitic Deformities that Develop during early Life. (*British Med. Jour.*, January 26, 1889.)

While a vigorous child in the erect or sedentary posture assumes attitudes of rest but rarely and for short periods, a feeble child habitually and for considerable periods maintains such resting postures. Numerous forces are thus brought to bear upon the yielding osseous tissues, amply sufficient, when long continued, to produce abnormal curves and actual deformities. A careful study of these forces acting upon the various joints is made, illustrated by elaborate drawings. The conclusions may be summed up in the statement, that the causation of such deformities is, first, the fixation, and subsequently the exaggeration of a normal physiological attitude of rest.

Beach, Fletcher: Idiocy and Instrumental Delivery. (*Lancet*, January 12, 1889.)

The author, from long experience in the Darenth Asylum for Imbecile Children, strongly disapproves of the statements recently made, that the use of forceps is a frequent cause of idiocy. He believes such teachings capable of doing much harm, and maintains that the use of forceps is preferable to prolonged and difficult labor, the prolonged compression of the head frequently resulting in asphyxia, paralysis, and other evils. Among eight hundred and ten cases he found but 4.3 per cent. due to the use of forceps and 26.6 per cent. due to difficult labor.

Down, J. Langdon: Idiocy and Instrumental Delivery. (*Lancet*, January 19, 1889.)

In a very large number of cases of idiocy, forceps were

employed in only three per cent. In every case, however, the friends of the child believed the instrument to be the cause of the disaster, but in nearly every case sufficient cause could be discovered in the neurotic history of the progenitors. The author believes tedious labor to be a more common cause than the use of the forceps.

Smith, Stephen: Anchylosis of the Knee-Joint as a Remedy for the "Dangle Leg" due to Infantile Paralysis Affecting the Entire Limb. (*Medical Record*, April 6, 1889.)

There is a class of cases, not infrequently met with, in which infantile paralysis has so far crippled the leg that it has become nearly, if not quite, useless. In many cases the leg is a mere "dangle limb," of no service whatever, locomotion being accomplished by the sound leg and a crutch. Various kinds of apparatus have been devised and employed for enabling the limb to sustain the weight of the body in walking. But such measures have been unsatisfactory. Amputation has been a favorite remedy of some surgeons.

Several years since the writer treated such a case by ankylosing the knee-joint, placing the leg in a nearly straight position, and the result was in the highest degree satisfactory. He has repeated the operation several times since, and has never failed to secure a useful limb.

A Discussion on the Operative Treatment of Club-Foot. (*British Med. Jour.*, October 27, 1888.)

The discussion is limited to congenital club-foot. Robert William Parker holds that the probable causation is a deformity in all the component parts of the foot. He believes that the cause is due to environment *in utero*. The foetal foot should change its position gradually, to determine the relative lengths of the muscles and ligaments, in order that the movements of the foot after birth may be normally accomplished. The true anatomy of club-foot can only be found in young infants or in children who have never walked.

Of all the tarsal bones, the astragalus is the one most frequently and most appreciably altered in form. An essential part of the anatomy of club-foot is that when the tissues require lengthening on the concave border, in the same proportion will the tissues be lengthened on the convex border, and require to be shortened before a cure can be effected. The redundancy thus produced at first leaves the foot without any support after rectification, and hence the reassumption of the old position directly we let go of the foot, and until suitable instruments are applied.

Treatment should be undertaken at the earliest possible moment. All cases of club-foot do not require surgical treatment. All cases should be manipulated from birth and a flexible metal splint applied. With the exception of the tendo-achillis, tenotomy might almost be abandoned as an independent operation.

The deformity is immediately rectified as much as possible, and a stocking of plaster of Paris applied. This is left about ten days; then the foot is well manipulated and a new dressing applied. At the end of a further ten days, more or less, a suitable instrument can be applied in order that the essential part of the treatment in the later stages—friction, manipulation, and passive movement—can be carried out.

Tarsectomy is considered unnecessary in infants and young children. Free division of the ligaments, together with careful after-treatment, will generally succeed. In cases over fifteen years of age tarsectomy is occasionally required.

Alexander Ogston: Nothing is more misleading than that club-foot is due to defect of tendons. The bones, being the hardest, are most resistant to rectification. Only the largest and strongest ligaments and tendons, such as the tendo-achillis, should be divided. Within the first year these three structures are easily overcome. Every succeeding year increases the difficulty.

Beginning within a few weeks after birth, suitable force will guide the growth into a better shape. It is well to begin at six weeks of age; then, under chloroform, rectify the deformity by prolonged and considerable force applied manually to such an extent that the foot does not spring back to its old position. Then a plaster-of-Paris splint is applied without intervening bandages or padding, and the foot held by the hand in as near a normal position as possible until the plaster is well set. The bandages are renewed at intervals of six weeks. As soon as the varus position is removed, the tendo-achillis is divided. About one year is required to complete the rectification.

In older cases we have a choice between cuneiform exsection, linear osteotomy, and excision of the astragalus. Exsection of the cuneiform leaves the patient no better off than with a Pirogoff's amputation. Excision of the astragalus gives the best result in desperate cases. Dr. Ogston has abandoned linear osteotomy.

James Whitson: The astragalus is the bone most often at fault. In the infantile stage a cure can be accomplished by bringing the foot to its proper position and maintaining it there. After the second or third year this cannot be done

successfully. The only method that then holds out any hope of permanent benefit is the extraction of a portion of the tarsus. This is, however, only the first step. Careful after-treatment for eighteen months or longer is necessary if we are to gain our object.

Incasing the foot and ankle in paraffin boots is a satisfactory method. Its cost is trifling, and it is unaffected by water.

When necessary it is advisable not to cut the tendo-achillis until the later stages.

In cases of talipes-varus from four years upward nothing short of the excision of the astragalus will suffice. Here, too, the same after-treatment must be adhered to.

George Buchanan: In minor cases due to shortening of the tendons fasciæ and ligaments the deformity can be overcome by force applied by the hand and kept so by a retaining appliance. A second class cannot be overcome by manipulation, but requires section of tendons and ligaments. Only those tendons are cut that cannot be stretched into position. The plantar fascia and some of the muscular tissue attached to it are divided. The method is clearly given in the original article. There is a third class, in which the bones are so altered in shape and relation that more is required. These are old cases. Professor Buchanan practises excision of the cuboid, excision of a wedge of the tarsus, and excision of the astragalus, according to whichever seems best suited to the individual case.

Noble Smith considered that osteotomy was rarely, if ever, required in children under ten or twelve years. Plaster of Paris was of the greatest use in the early stages. Until the foot can be placed in a perfect position the bandage should be reapplied as often as every week or ten days.

H. P. Symonds preferred dividing the tarsus with the chain-saw to any other method of osteotomy. As performed by him it is almost a subcutaneous operation. It is easily done and leaves no deformity. The method is described in the original article. At the end of a week the foot is put up in plaster of Paris for a month or six weeks.

Page: Anchylosis of the Jaw following Measles successfully treated by Excision of a Condyle. (*British Med. Jour.*, November 24, 1888.)

The child was nine years old. When two years old she had an attack of measles, followed by profuse and prolonged discharge from the right ear. Within six months there was gradual closure of the mouth, and for six years the jaw had been fixed. Mr. Page cut down upon the right temporo-

maxillary joint, and found the condyle absorbed and the jaw welded to the skull. The bone was removed by chisel and mallet; the girl could now open her mouth widely. Mr. Page showed a boy on whom he had performed the same operation two years before, with similar result.

Legat: Pigmentary Nævi. (*British Med. Jour.*, November 24, 1888.)

Mr. Legat showed an infant whose head, body, and upper extremities were the seat of numerous elevated growths of a dark—in some places almost black—color, varying in size from that of a sixpence to that of a florin. The greater part of the back was covered with a red squamous eruption, and there were several patches of a like nature on the arms. The child was extremely lively. There was no history of syphilis. It was thought that these growths might develop into melanotic sarcoma. It was also thought that there were two factors,—one due to syphilis,—and that the more elevated patches were nævi.

Thompson, Maitland: Tracheotomy for Foreign Body. (*British Med. Jour.*, November 24, 1888.)

A boy, aged four years, had been suffering five hours from difficult breathing. When seen the boy was completely prostrate, cyanosed, and breathing spasmodically. On grasping the trachea between the fingers and thumb something could be felt to shoot up and down at each inspiration between the vocal cords and the bifurcation of the trachea. The child was obviously dying, and, other measures having failed, tracheotomy was done, and the wound held open some time with a nasal speculum, when a pea was expelled through the wound. The child, though so far gone as not to need holding, began to show signs of animation, and in a few hours could swallow liquids. The wound healed by first intention.

Morgan: Meningocele at the Base of the Nose. (*British Med. Jour.*, November 3, 1888.)

Mr. J. H. Morgan showed a child, aged sixteen months, with a meningocele at the base of the nose. The child was healthy in every other respect. The tumor was congenital in origin, but grew at first out of proportion to the child. On several occasions cerebro-spinal fluid was evacuated and small quantities of Morten's fluid injected. No untoward effects followed, but neither did any diminution in the size of the tumor. The soft part of the swelling which protruded was reducible and pulsated synchronously with the brain.

No subsequent treatment had been attempted.

Mr. Edmund Owen had seen nævus resembling this one, but he agreed that it was best left alone.

Against the possibility of the tumor being a nævus was the pushing forward of the bones. At the upper part of the tumor was a long prominence, terminating at the base of the nose in a sharp, uneven edge, which could be traced along the lateral margin.

Isaac: Absence of Right Parietal Bone. (*British Med. Jour.*, September 1, 1888.)

In a fine, healthy boy, born at full term, the right parietal bone was absent. Over its site the skin was loose and distended with fluid; palpation produced fluctuation. The edge of the surrounding bone could be distinctly defined. One month later the child was again seen. The site was now occupied by bone, except a piece as large as a shilling, in the upper part. The bone was firm but somewhat nodular, especially over the site of the space that was last to disappear.

Lewis: A Case of Deep Cellulitis of Neck following Acute Otitis-Media. (*British Med. Jour.*, September 1, 1888.)

A boy, aged thirteen, had received, fourteen days previous, a box on the ear at school. Following this he complained of sore throat and earache. In a few days the temperature ran up to 102° to 104° and delirium came on at night. He suffered from pain in the head and obstinate vomiting. It was thought probable that it was a case of cerebro-spinal meningitis. About the tenth day there was redness and swelling over the mastoid, and the cerebral symptoms almost subsided. The mastoid puffiness subsided only to be followed by a deep-seated inflammation of the neck, which rapidly assumed an alarming size. There was no perforation of the tympanic membrane, but it had a boggy appearance and its lustre had gone. Hearing was almost gone on the affected side. The swelling in the neck rapidly developed to an enormous size, and as hard as a board. The induration extended from beyond the posterior border of the sterno-mastoid to the median line of the neck, and from the clavicle to the floor of the meatus. There was no tendency to pointing, and, after some delay, it was decided to make an incision a few inches above the clavicle. A caseous mass was found, and after it was removed some pus was discharged. From this time the symptoms began to subside. Following the trouble there was some difficulty of movement in the right arm, owing to the injury to the deep cervical plexus. Owing to some trophic change

he lost the nails from three fingers. The patient made a good recovery. This case affords a striking instance of the absolute necessity of making a thorough examination of the ear in all cases of cerebral symptoms.

The suppuration of the middle ear in this case was in all probability due to concussion produced by the blow.

The severe cerebral symptoms may be due to the want of free egress to the pus when formed. The symptoms would probably have been less severe if the membrane had become perforated either spontaneously or by artificial means.

The escape of pus through the mastoid in all probability saved the patient's life.

Bezold was the first to point out that when the inflammation of the mastoid process is confined to the inner aspect of the apex, pus easily forces its way through the thin osseous layer which there protects the air-cells; and thus readily extends beneath the sterno-cleido-mastoid muscle, and so the pus escapes into the deep tissues.

The points of special interest which this case presents are,—

1. The unusually severe cerebral symptoms in a case of suppurative otitis-media, and such occurring after a blow.

2. The absence of perforation of the membrane which so generally takes place in such cases.

3. Rapid formation of deep cellulitis of the neck following so quickly the appearance of mastoid swelling and puffiness.

4. An unusual paralysis of arm following cellulitis.

“PEDIATRICS does not deal with miniature men and women, with reduced doses and the same class of diseases in smaller bodies, but it has its own independent range and horizon, and gives as much to general medicine as it has received from it.”—A. JACOBI, M.D., in Keating's “Cyclopædia of the Diseases of Children.”

“A STUDENT confronted with a sick child may be moderately well acquainted with diagnosis as practised in our general hospitals, but may feel as if all his knowledge and all his methods had suddenly failed him; he may experience the same sense of helplessness which a traveller will have when suddenly cast adrift in a strange land, of whose customs he is ignorant, and whose language he has not learned.”—JAMES FINLAYSON, M.D., in Keating's “Cyclopædia of the Diseases of Children.”

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Original Communications.

THERAPEUTICS OF INFANCY AND CHILD-
HOOD.

BY A. JACOBI, M.D.,

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Diseases of Children in the College of Physicians and Surgeons, New York, etc.

(Continued from August Number.)

VI.—DISEASES OF THE DIGESTIVE ORGANS.

THE therapeutics of *constipation* depends on its etiology and its degree. In no case should the diagnosis be made without a thorough examination, which must be manual in many. The abdomen may be painless, but it is mostly inflated. Fæces come away in large lumps or small and broken pieces. Liver and spleen may be displaced, the former turned in such a way as to protrude its edge and posterior surface. The abdominal veins may be enlarged, appetite diminished; vomiting is sometimes met with, occasionally also attacks of diarrhœa which are the result of the irritation produced by the hardened fæcal masses contained in the colon.

Actual constipation must not be mistaken for an apparent one, which is observed in infants who have a movement every two or three days only; the amount of fæces thus discharged is apt to be trifling. The baby is emaciated, atrophic, not always fretful. In him the scantiness of defecation is the result of lack of food, and the alleged costiveness is speedily rem-

edied by the furnishing of a sufficient quantity of appropriate nourishment.

Among the foremost causes of constipation is mechanical obstruction, brought on by cystic and other tumors, imperforation, hernia (pervious and incarcerated), intussusception and twisting of the intestine, or by a peculiar condition of the sigmoid flexure described by me in the *Journal of Obstetrics* of 1869, and lately in the "Intestinal Diseases of Infancy and Childhood," p. 184. There I have detailed the embryological and anatomical facts connected with the subject, which ought to be well understood by this time; for the cases of constipation, depending on the undue length of the descending colon and the multiplicity of flexures which compress each other and thus obstruct the passage, are quite numerous in every physician's practice. These cases of constipation are apt to last up to the sixth or seventh year and require constant attention, but medicinal treatment ought to be avoided. The fæces may be so hardened and immovable as to necessitate their removal from the rectum by means of the finger or a spoon. On no account must purgatives be given as a regular thing, but an enema must be administered daily for many years in succession. At the above-mentioned age the relation of the several parts of the intestinal tract becomes more normal, and the necessity for mechanical interference ceases accordingly.

An improper condition of food is a frequent cause of constipation. Superabundance of casein is relieved by diminishing its quantity, by replacing the milk of a cow by that of a wet-nurse, the white and heavy one of a wet-nurse by the thinner and more bluish one of another woman, or by reducing the amount of casein in artificial food to one per cent. Besides, the milk thus reduced must be mixed with a glutinous (farinaceous) substance; oatmeal, to remedy constipation, is preferable to barley or any of the rest. Large amounts of starch must be avoided. Milk and artificial food will often lose their constipating effect by the addition of cane-sugar. Babies at the breast are often cured of constipation by the administration of one or two teaspoonfuls or a tablespoonful of water, or oatmeal water, thoroughly sweetened, before each nursing.

Many preparations kindly supplied by the ever-watchful

and humanitarian trade contain large quantities of phosphates. They are apt to pass in part into the intestine undissolved and unabsorbed. So will large doses of bismuth. Thus constipation may follow their use. The treatment of such a case is plainly indicated; likewise those which are the direct result of the administration of astringents and opiates. The omission of such medication is the first condition of a cure.

Constipation is often dependent on the partial absence or the viscid condition of intestinal mucus. This is so in fevers, now and then in chronic (intestinal catarrh) enteritis; also when there is too large a secretion from the skin and (or) kidneys, and when too little water is introduced into the system. I have repeatedly emphasized the fact that most infants are given less water than they require.

Incomplete peristalsis resulting in costiveness may depend on a morbid condition of either the muscle of both the intestine and the abdominal wall, or its innervation. Early rhachitis shows its effect in producing muscular incompetency; babies with regular evacuations after birth will become costive in their second and third month, and remain so although they are alleged to "look the picture of health." Not rarely rhachitis will make headway in muscles, epiphyses and diaphyses, even in cranial bones; while the weight of the patient does not decrease, his skin feels soft though flabby, the limbs and trunk are rotund though bleached. Indeed, there are many in whom constipation is the very first symptom of rhachitis. In all of them it is self-evident that constipation cannot be relieved permanently except by a thoroughly successful antirhachitical treatment. Sedentary habits of school-children have the same effect in producing constipation. It is relieved by change of habit and plenty of physical exercise, and additional fruit diet, but purgative medicines, given persistently, render these cases worse. The binding effects of chronic peritonitis, either general or local, must not be combated with purgatives; a snug bandage round the abdomen gives support and tone to the bowels, and an enema, given every day for months in succession, prevents accumulation and its consequences (dilatation, disorder of circulation, septic absorption). Universal emaciation and atrophy resulting in constipation has its own indications, and

chronic cerebral disease (hydrocephalus) may require such local and medicinal treatment as will be detailed further on.

In all forms of constipation in infants or children few medicaments ought to be used. As there is so often an excess of acid in the gastric and even intestinal contents, calcined magnesia finds its twofold indication. It may be given in many small doses or a single large one which need not exceed five or ten grains a day. Doses of a grain or two grains may be continued for many days and repeated from three to six times daily. Rhubarb acts well when combined with it for the purpose of overcoming protracted costiveness. Rectal injections may be given from the common fountain syringe, the nozzle of which must be introduced beyond the two sphincters. In some cases it is desirable to introduce the instrument to a greater distance; an elastic catheter attached to the nozzle can be used for that purpose, but the very condition of the sigmoid flexure, detailed above, renders the introduction of the instrument beyond the very beginning of the sigmoid flexure a perfect illusion. It happens quite often that an elastic or flexible tube, when introduced beyond the third sphincter, bends upon itself and reappears at the anus. To facilitate the entrance of the liquid into and beyond the sigmoid flexure the injection must be made gently and slowly while the pelvis of the infant is raised.

To facilitate the downward movement of fecal masses and to stimulate peristalsis, friction and kneading (massage) may be resorted to. Kneading must be performed with the palm of the hand, gently and persistently; friction is best commenced in the right side and continued over the epigastrium and down the left side, in the course of the colon. Great caution and judgment must be used because of the frequency of local chronic peritonitis, which may give rise to subacute or acute exacerbations.

Electricity has been used successfully when constipation was the result of insufficient peristalsis. E. Schillbach found that the several portions of the intestinal tract respond differently to the application of the faradic and galvanic currents. The latter appears to have a stronger effect than the former. Local contractions result from the negative pole (cathode),

peristaltic waves from the positive (anode). Thus for the relief of chronic constipation depending upon incompetency of muscular action the former ought to be applied to the interior of the rectum, the latter over the abdomen, along the colon.

In the cases of persistent constipation depending upon an insufficient muscular action of the intestine now and then medication may appear required. I have treated a number of cases of the kind with nux and (or) calabar, adding some purgative extract. A little boy with a decidedly rhachitical history, three years old, took three times a day a sixteenth of a grain of each, extract of nux vomica, extract of fab. calabar, and compound extract of colocynth, for many weeks in succession. But cases of the kind must remain exceptional. As an occasional purgative, for the purpose of relieving the intestinal tract of indigestible and injurious masses, castor oil is probably the best and mildest; a few grains of calomel will act both as a purgative and antifermentative. The compound powder of liquorice will take the place of oil, when the latter is not tolerated, or is objected to; also the fluid extract of *rhamnus frangula*.

Among the drastics, all of which are irritants, rhubarb and aloes are probably the mildest, and are tolerated a long time in succession. Of the salines, chloride of sodium is the simplest. Its main action is osmotic; besides, it occasions thirst and thereby induces the ingestion of a large amount of water. The continued use of salines irritates the mucous membranes. The combination of the sulphate of sodium with the sulphate of magnesium and chloride of sodium has a mild and happy effect.

A frequent accompaniment of constipation is *colic*. Its causes are, beside constipation, fermenting food, gastro-intestinal catarrh, the presence of ascarides in large numbers, reflex spasm produced by cold feet and chilled skin, diminished tonicity of the muscular layers of parts of the intestine (in general anæmia and rhachitis during early infancy), and, finally, chronic peritonitis, which resulted in adhesions, or such local changes in the walls of the intestine as will produce local contractions or dilatations. Thus as the etiology of colic varies so much, the treatment must vary in order to be rational and

effective and adapt itself to the cause. Its symptomatic treatment will often require either an enema or a purgative medicine, antispasmodics or narcotics (assafoetida, opium); they are apt to give speedy relief. Gentle friction of the abdomen, the application of dry heat (flannel, hot plate, hot sand-bag), and the administration of hot aromatic teas, freshly prepared (fennel, anise, catnip, German chamomile), a few drops of essence of peppermint in a teaspoonful of hot water, or the injection into the rectum of large quantities of aromatic teas, at a temperature of 100° or more, will do good; great care must be taken lest atmospheric air enter the bowel.

The predisposition of infants (and children) to *diarrhœal affections* has been treated in a special chapter of my "Intestinal Diseases of Infancy and Childhood" (p. 190). Finding its explanation in anatomical and physiological facts, it demands no correction; but has to be taken into account in every case of diarrhœa to avoid a misconception of what is normal in regard to both the number and consistency of evacuations.

Diarrhœa is always dependent on, or connected with, surface changes of the intestinal mucous membranes, from a simple catarrh to ulceration. Catarrh may be localized, but is generally very extensive. It may descend from the stomach, ascend from the rectum and colon, or originate in any part of the small intestine.

The treatment of diarrhœal diseases depends in part on the locality, in part on the etiology of the individual affection. No "specific" treatment will ever do good, not even the modernized stomach-pump sticking conceitedly out of the coat-pocket of the delighted medical man who appears eager to emulate the midwife of our mothers with the rectal syringe under her arm as her emblem. Thus, indeed, unless it be the intention to fill these pages with prescriptions to be copied thoughtlessly, nothing can be permitted here except general indications for treatment. My readers will have noticed that I have carefully abstained from prescription writing in these papers. They are written for my peers, and not for the very beginner who looks for the most advanced accomplishment in a formula, nor for those who like to be supplied with their medical brains by the loquacious agent of the manufacturer

furnishing diagnosis, indications, formula, and medicine for doctors and mankind, from the ubiquitous satchel.

The causes of diarrhœa are various. Food in improper quantity or quality, mostly improper artificial food, is among the principal causes. But even mother's milk may cause it, as is proven by the fact that there are babies who, while falling sick at the breast of one woman, may recover at that of another. Mothers who are sick or convalescing, or subject to very strong emotions, those who nurse too often, who suffer from tuberculosis or syphilis, who are pregnant, some when they are menstruating, and all anæmic persons, secrete an improper milk. The colostrum secreted immediately after child-birth is apt to give rise to diarrhœa. Milk containing too much fat is the principal cause of what has been described as "fat diarrhœa," by German authors mostly; that containing salts in superabundance, mainly in anæmia, is liable to produce the same effect.

The amount of food introduced may be too large either absolutely or relatively; the latter when the secretion of gastric fluids is insufficient, thus facilitating gastric fermentation in place of digestion; or when the flow and activity of pancreatic juice, limited at a very early age, is still more interfered with by a diseased condition of any kind, and fever of any description.

The infant intestine is not controlled to the same extent as that of the adult by emotional influences; but local irritation is a frequent cause of diarrhœa, and the organ is very sensitive to the diminution or increase of atmospheric moisture and heat. It is quite probable that the overheating of the general surface has results similar in character to what is known in adults also, as the consequence of external combustion on the condition of the duodenum and the general nervous system.

The mucous membrane with its lymph-vessels and glands is easily irritated by such results of fermentation as phenol, indol, skatol, bacteria, and bacilli; by the alkaline salts formed through the frequent (normal and abnormal) prevalence of acids in the upper part of the intestinal tract; by the direct influence of purgatives, occasionally by even the very smallest doses of arsenic and mercurials, though, indeed, the latter are

tolerated very much better by the very young than by the adult ; and by exposures to cold. It is also liable to suffer long from the results of typhoid fever, dysentery, and occasionally from severe attacks of malaria.

Disturbances of the circulation depending upon diseases of the liver, lungs, or heart, predispose to passive hyperæmia of the intestine and diarrhœa. Indeed, when it does occur under these conditions, it is an ominous symptom. In no case of intestinal disease the diagnosis ought to be considered complete or the prognosis ventured upon, unless the liver, and particularly heart and lungs, have been examined with great care.

The variety of causes suggest a number of different treatments. Disorders of circulation must be regulated while the local disease is attended to ; ulcerations of the intestines are to be treated on some such method as has been suggested in a previous essay on dysentery ; the skin must be kept cool by bathing or sponging ; the air-supply cool and plentiful.

Most cases of intestinal catarrh (with or without gastric catarrh) and diarrhœa depend on the presence of improper food and the derangement produced by it. It ought to be removed as speedily as possible. When the process of fermentation is still limited to, or going on in, the stomach, or the stomach still contains injurious masses, these ought to be brought up. In such a case the sound judgment of the practitioner has to decide whether emesis is still useful, or whether the stomach ought to be irrigated and washed out. Most cases of "gastro-enteritis" are pre-eminently enteritis ; therefore the claim that the washing out of the stomach must not only take place in every case, but is the almost infallible remedy in the very worst class of cases, will have no other result but that of discrediting that useful procedure in the eyes of those who are inclined to believe implicitly in the value of "new" methods and the pretentious claims of short-sighted enthusiasts. If we were to believe some of the loud talk of the journals, and the reporters' columns in the secular press, gastro-intestinal catarrh would soon be "one of the lost arts."

In fact, the injurious element is in most cases beyond the reach of the stomach-pump ; indeed, the latter cannot remove anything but what is dissolved or suspended ; the expulsion

of large masses, curd particularly, through an elastic catheter is out of the question.

The rôle played by bacteria in the stomach and intestines is probably great, but it is surely exaggerated, for the class of the schizomycetæ is numerously represented alike in the healthy and diseased intestine. Even within from four to eighteen hours after birth there are large numbers of bacteria, cocci, bacillus subtilis, and bacterium coli commune (Escherich) in the remnants of digested milk; the latter in the large intestine. How many are introduced into the stomach, immediately after birth by the newly-born swallowing air, cannot be determined. Besides those enumerated above, there is the bacterium lactis aërogenes which is credited with the decomposition of milk-sugar into lactic acid, carbonic acid, and hydrogen, thus giving rise to the gases constantly present within the intestinal tract.

The presence of immense quantities of micro-organisms proves, however, nothing in regard to the etiology of diseases, for they are found in the healthy condition as well, as also in such morbid conditions in which the cause of death cannot be attributed to the presence of parasites or the usual pathological changes. Thus in arsenical poisoning the intestines are swarming with saprophytes.

The intestine can be emptied by either purgatives or enemata; the former act upon the whole length of the intestine, the latter upon its lower portion. Castor oil, so common in domestic practice, deserves all the credit given to it. It acts mildly and speedily. The addition of opium is not wise; the latter may be administered after the former has exhibited its effect; the action of the oil must not be inhibited by the sedative. In many cases a single dose of calomel (one-half grain to six) answers better, being both a purgative and antifermentative.

The surplus acids of the stomach—mostly lactic and butyric—must be neutralized. Magnesium and sodium salts must not be selected for that purpose, for they add to the diarrhœa. Calcium salts, the carbonate or phosphate, are preferable because they have no such effect, but the additional advantage of forming with the fat acid an insoluble salt which

acts as a protection to the sore surface. Doses of from one to two grains may be given every hour or two. Beside being an anti-fermentative in general, bismuth (the subnitrate or carbonate) binds sulphide of hydrogen, and thus has a favorable effect in doses of from a quarter of a grain to two grains. They may be administered with or without the addition of opium. If they be given in liquid form, no syrups must be added to correct the taste, but rather glycerin, which has the advantage of not turning sour.

To combat the existing fermentation, anti-fermentatives must be given in regular intervals. Calomel, bismuth, alcohol, creasote, salicylate of sodium, salol, naphthalin, resorcin, bichloride of mercury, and others, have been eulogized. To take effect in the intestine it appears that those who are not readily soluble in the stomach ought to prove more useful. Still, I feel positive that resorcin in doses of from a quarter to one-half of a grain in solution, or as a constituent of a powder containing bismuth, chalk, or (and) opium, given every two hours, has rendered me the most valuable services in a great many cases. Of the two mercurials I prefer calomel by far, in doses of from a twentieth to a quarter of a grain every few hours. The anti-fermentative effect of alcohol in the dilution in which we are entitled to give it as a stimulant, though the sum total of a daily dose may be large now and then, is not great; salicylate of sodium is less effective than any of the rest, creasote acts more vigorously in the stomach than in the bowels, salol and naphthalin are not easily borne by many.

Opium, by its inhibitory effect on reflexes, diminishes hyperæsthesia, hyperperistalsis, and hypersecretion. The objections to its use in the diarrhoeal diseases are theoretical only. Doses of from one-tenth to one-third of a grain of Dover's powder every two hours, in all sorts of combinations, act very well indeed, and may well be considered indispensable, when the above indications are to be fulfilled. Its time has arrived when the odor of the evacuation begins to be normal; but it finds no contraindication in those cases of "follicular enteritis" of a chronic nature which exhibit their tendency to malodorous discharges for weeks in succession.

In acute cases, and when the stomach participates in the pro-

cess, astringents, such as lead, tannin, gallic acid, alum, etc., are badly borne. In chronic protracted cases they will find their indication. Nitrate of silver does better in many cases, one-fiftieth to one-thirtieth of a grain in two drachms of distilled water (dark bottle) every two hours. In chronic cases only, coto, from half a minim to a minim of the fluid extract, will sometimes act favorably.

Of the stimulants, alcohol may be admixed to food. Bad brandy or whiskey contains fusel oil, which is a paralyzing agent. Whiskey is therefore preferable with us, because it can be obtained in greater purity for less money. It must not be administered unless diluted. Camphor is better borne than ammonia. It is easily taken when simply rubbed off with glycerin and suspended in mucilage (one-fourth to two grains every one or two hours). The strongest nerve-stimulant of all is Siberian musk. Urgent cases of collapse require one to two grains every fifteen or thirty minutes (best suspended in mucilage) until six or twelve grains have been taken. A very good stimulant in collapse is the injection into the bowels, through a long flexible tube (catheter No. 12) of hot water with some alcohol, and one or a few drops of tincture of opium. In threatening cases of heart-failure strong coffee, hot or iced according to circumstances, by itself or in mixtures, may be used to advantage. Cold tea may be tried in small doses, particularly in the chronic cases of older children.

In acute cases of intestinal (or gastro-intestinal) catarrh with high temperature, applications of water, of from 60° to 70° F., to the abdomen will render good service. The cloth must be wrung out thoroughly, covered with rubber cloth and flannel, and changed when warm. Anæmic children and those with much pain require warm or hot applications, which may be preceded by a warm bath. Frequent injections of water of 100° and more, with or without an antifermentative, such as thymol (1 : 1000 or 2000), answer well in most cases, not only in rectal catarrh.* In great debility, or collapse, the water ought to be from 105° to 112°, and contain some alcohol and opium, or (and) a teaspoonful of the tincture of musk.

* A. E. P. Davis in *The Medical News* of July 6, 1889.

The addition of gum-arabic to the injection, or the use of glutinous decoctions (flaxseed) instead of water has a satisfactory influence. Starch injections have the advantage of adding to the nutrition of the body by the facility with which the colon changes amylum into dextrin, which will be absorbed. Part of the injected water will always be absorbed, fill the blood-vessels, and may prevent intercranial and other thromboses. Indeed, in many bad cases in which the cerebral symptoms of the so-called hydrencephaloid condition have made their appearance, or are imminent, frequent injections into the rectum of a few ounces of warm fluid contribute considerably to the restoration of circulation.

In hot weather doors and windows must be kept open, the coolest place selected in the house or neighborhood, day or night; for night air is preferable to no, or foul, air, sea air or country air, particularly at some altitude, to the city. When the weather is hot and the body warm, it must be washed with cold or cool water, or water and alcohol (5 : 1), frequently. Cold feet must be kept warm.

The food-supply must depend on the condition of the stomach and the upper part of the intestine, and also on the rapidity of the peristaltic action of the latter. The complication of gastritis with enteritis contraindicates the introduction of food altogether. Abstinence is better in cases of intense vomiting than the use of ice; the latter may quiet the stomach for a while, feel pleasant, but it fills the stomach which ought to remain in absolute rest, and excites peristalsis. As I said in a previous paper, babies tolerate abstinence better than ingesta on an irritated stomach. Beef-tea ought to be avoided; its concentration of salts is irritating. If in convalescence it be given at all, it must be mixed largely with barley-water or rice-water.

In all cases of "summer" diarrhœa milk must be avoided. Bad cases forbid raw milk, boiled milk, milk in any and every shape, for days and longer. Its rapid transformation and fermentation contraindicate even the smallest quantities, also its presence in farinaceous mixtures. The absence of gastric juice (pepsin and hydrochloric acid) in the stomach of a feverish child or one that is being drained of its fluids pre-

vents the digestion of albuminoids. Even mother's milk is often not borne to any extent. When milk is again tried after a while, it ought to be done very carefully ; cow's milk thoroughly boiled, or sterilized with six times its volume of barley-water at first, the percentage of milk to be increased slowly. We must not forget that cow's milk, ever so often boiled or sterilized, is still cow's milk. Milk may be replaced by the white of egg, which must be thoroughly mixed with barley-water, and some salt added, and as much sugar as is required to make the mixture palatable. During the course of a day and night the whites of from one to five eggs may be given according to the case and age. Severe vomiting and diarrhoea demand, as suggested, total abstinence for from two to eight hours or more.

Afterwards, mucilaginous or farinaceous decoctions may be given in small doses at short intervals. A mixture which has rendered me very valuable services is about as follows : Five ounces of barley-water, the white of one egg, from one to two teaspoonfuls of brandy or whiskey, some salt and sugar ; a teaspoonful every five, ten, or fifteen minutes according to circumstances. Mutton broth may be added to the above mixture, or it may be given by itself, with the white of egg and some salt.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from August Number.)

VIII.—DENTITION.

No subject in pediatrics possesses so large and varied a literature as that of teething. Upon no subject do we find more diversity of opinion than upon teething. It is, therefore, very natural that great importance should be attached to its discus-

sion, which ought to be carried on in a thoroughly objective manner. The latter, unfortunately, is an exceedingly difficult matter, for more than one reason. Nearly all the medical superstitions of childhood pertain to teething. Social position, education, culture, do not seem to eradicate them; a string of amber beads, a mouse's tooth, or a bag containing some odoriferous compound may be found in the mansion as well as the tenement-house. It is not an easy matter for the physician to stand by patiently and have his skill counteracted by an amulet. Moreover, the idea of the causation of disease by teething has taken such deep roots in the minds of people that diseases easy of treatment end fatally, because they are either overlooked or attributed to the process of teething. It is not difficult to answer the question, "Who is to blame?" If a cursory glance be taken at the literature of the subject, authors will be found—and good ones, too, both old and modern—who do not hesitate to ascribe any form of disease to teething. The more improbable the connection between teeth and disease, the more delight does the average author find in stating that the affection is due to teething; or, if he be of a speculative turn of mind, the more ingenious will be his method of tracing cause and effect. It would be an interesting though useless task to collect all the diseases that have been evolved from teething. Then there are those who, writing for and not from experience, copy what has been said by others, accepting facts badly collected and not thoroughly verified; these are the ones that go to make up the number who assist in the errors that are being made daily, for they are authors, and an author is supposed to be an authority. Hebra, the great dermatologist, who detested rushing into print, would say to the person who entertained a new view concerning eczema, "When you have seen ten thousand cases of eczema come and talk to me." It is not necessary to have seen ten thousand children teething, in fact, not one-fifth the number; but it would be conducive to the welfare of humanity if physicians would take the trouble to observe teething children more and believe less in what has been written on the subject. Almost daily do we see errors in diagnosis occur because of the doctrines that have been and are being taught on the sub-

ject of teething. This statement can be substantiated by any number of cases in the experience of the observing physician.

It is but natural to ask for patience and quiet, impartial judgment in the discussion of this subject, when one sees the errors that are committed as the result of this kind of teaching. Within a short space of time I have seen the gums lanced in children suffering from pneumonia, measles, and tubercular meningitis; in each case the diagnosis of teething had been made, in each case the child died, and in each case both the physician as well as the surroundings were settled at the bedside with the stoicism of followers of Mohammed.

We deal with two processes: one, normal dentition, which is admitted to exist even by the most rabid adherents of the teething doctrine (only in about twenty per cent. of all children, however); the other, abnormal dentition, or *dentitio difficilis*. Before going on to the further description of the two processes, it will be both interesting and profitable to look into the history of the subject.

The late L. Fleischmann, of Vienna, published a small volume in 1877 ("Klinik d. Pediatrik"), in which a complete history of the subject will be found, and from which the following abstract is made. Fleischmann was one of the most thorough authors who has ever written upon pediatrics, and his early death left a great void in the ranks of active workers in diseases of children.

We again begin with Hippocrates (400 B.C.). In the apocryphal work "De Dentione," we find that children teethe more easily when they have loose bowels, and better in winter than in summer; that those having a cough teethe late and lose flesh. In his "Aphorisms," which are considered genuine (Sect. iii.), the statement is made that teething children suffer with itching of the gums, fever, convulsions, and diarrhœa, especially when the eye-teeth come through. Fat children and those that have a tendency to constipation suffer most. He knew that the teeth are formed during foetal life, and advised that the children be allowed to bite upon hard substances during teething.

Aristotle (384-322 B.C.) had erroneous notions concerning teeth: that men have more teeth than women; that the teeth

continue to grow during the whole lifetime of the individual, and that repeated teething occurs in strong people.

Galen (131-203 A.D.) tells us that the teeth act as foreign bodies during eruption, and that they produce all possible bad symptoms, because they cannot be encapsulated like foreign bodies. Some of his pupils believed the most wonderful things: the gums should be rubbed with dog's milk, or with the brain of a rabbit, in order to cause the teeth to come through more rapidly; here, too, we find the first mention of an amulet's power against the pains of teething, "*Veteris cochlæ cornu pelliculæ illigatum pro amuleto appende.*" The first tooth was considered an epiphysis of the permanent tooth in order to explain Aristotle's erroneous notions. Oribasius (326-403 A.D.), an indirect follower of Galen, prefers Cyprian butter, or oil of lilies, to the brain of a rabbit.

Aetius, at last, developed the whole subject of diseases of dentition. Irritation from the tooth produces inflammation which may extend to the ear, the nose, the eyes, the stomach, may produce fever, etc. The child must not be allowed to become constipated, otherwise the inflammation will extend upward. Oil must be used to rub the gums, but hard substances must not be given to the child to bite upon, as they harden the gums; amulets (*e.g.*, the tooth of a viper encased in silver) are of great value.

Paul of Ægina (625-690) states that convulsions are apt to occur during teething: these he counteracts by washing the child with a decoction of heliotrope; he cures diarrhœa by placing a spice-bag with rose-seeds upon the bowels (it is pleasant to meet some of our old friends twelve hundred years back); the itching of the gums is diminished by the use of old herrings.

Rhazes (860-932), in his work "*De Ægritudinibus Puero-rum*," writes as follows: "Prurption is easy and is accompanied by little pain when the teeth come through rapidly, but they are not strong, and, *vice versa*, when they grow slowly, the pain is greater but the teeth are stronger." Teething is easier in spring than in winter; in summer teething is painless, but abscesses of the cheeks and gums, as well as itching of the ears, are more common; hemorrhages, fever, diarrhœa,

or constipation may also be present. He makes no mention of convulsions.

Avicenna adds nothing original to the work of his predecessors.

Vesalius (1514–1564) was the first to practise incision of the gum in case of a wisdom-tooth.

Eustachius was the first to controvert the views of Aristotle, Galen, and Vesalius, and to verify the statement of Hippocrates,—*i.e.*, that the teeth are already formed in the fœtus. He also opposes the view that the eye-teeth have anything to do with the eyes.

Ambroise Paré (1510–1599) first advised lancing of the gums in difficult teething. He reports that those teeth that had been lanced in a child dying from difficult teething came through even after the death of the child.

After this period the most curious theories are to be found in the literature of teething. Scarification is almost universally recommended; amulets increase in number, and are divided into classes according to their supposed strength.

This sort of medication continues through the seventeenth century; in the eighteenth century the amulets are dispensed with; but the number of diseases and symptoms due to teething is gradually increasing. John Hunter (1772,—*The Works of J. Hunter*, 1835) gives the following list: “Diarrhœa, costiveness, loss of appetite, eruptions on the skin, especially on the face and scalp, cough, shortness of breath, with a kind of convulsed respiration, and similar to that observed in whooping-cough, spasms of particular parts, either by intervals or continued, an increased, and sometimes decreased, secretion of urine, a discharge of matter from the penis, with difficulty in micturition, resembling symptoms of gonorrhœa in its violent form. The lymphatic glands are apt to swell at this time; if the child has a strong tendency to scrofula, this irritation will promote the disease. There may be many other symptoms with which we are not at all acquainted, the patients, in general, not being able to express their feelings.” For treatment, cutting the gums is “the only method of cure.” “It often happens, particularly when the operation is performed early in the disease, that the gum will reunite over the teeth; in which

case the same symptoms will be produced, and they must be removed by the same method." He has lanced the same teeth ten times, giving relief each time, but followed by a relapse.

Jacob Plenk (1779) adds the following list to those diseases already mentioned : Gutta rosacea, deafness, amaurosis, swelling of the knees, paralysis, and lameness in one or both legs, suppuration, and dry gangrene.

Rosen von Rosenstein not only believes that any ill can result from teething, but thinks that every child ought to be prepared for teething as soon as it reaches the age of three months ; the gums should be rubbed with the finger every day in order that they may become thin enough for the teeth to come through without giving pain. If this has not been done, he recommends one of a thousand and one remedies to soften the gum as well as giving relief to pain by means of venesection, leeches, and scarification.

Girtanner (1796) adds a few more diseases to the long list,—increase in the flow of bile, nausea, stomach cramps, fainting, and epilepsy.

Armstrong (1786) is the first who dares to lift up his voice against the views that have been expressed. He does not believe that all cases dying about the time of dentition die from teething, and warns against the too free use of the gum lancet, having seen the scarification of the gums followed by fatal issues.

Beginning with this we first find Wichmann (1800) opposing these views expressed by the older authors with great firmness and with all the logic and force that followed the knowledge of physiology. He ends his long article as follows : "It is to be hoped that, in the future, dentition will be called up only when it would be impossible to comfort the relatives with the impotence to designate the true nature of the disease or to quickly calm the laity."

From this time the two opposing camps have been formed : in the one, those believing in the possibility of production of all kinds of disease by teething ; in the other, those believing in the production of teeth, and teeth only, with occasional bad symptoms by this same process. On both sides there are champions worthy of the cause : Barthez and Rilliett, West,

Bednar, Steiner, Vogel, and a great many others, for the diseases produced by dentition; Politzer, Bouchut, Fleischmann, and, in our country, Jacobi especially, against this view. Jacobi has done more than any one, probably, to place the whole subject of dentition upon its proper level (1862); and the thoroughness and analytical acumen displayed by him in his argument are such that it requires but close following to be thoroughly convinced of the truth of his deductions. In order to be able to make deductions, it is necessary to take a cursory view of the whole process of teething as it goes on normally. It will be readily understood that a detailed description, histological and biological, would be entirely out of place here; it is our object to view the conditions from the aspect of topographical anatomy so that reference to it can be had in the following discussion.

The statement that the greater part of the process of teething is accomplished before the child is born will, I hope, be thoroughly verified by what follows. About the seventh week of the intra-uterine life a ridge is formed within the mouth, caused by a thickening of the oral epithelium, and at the same time a dipping down of this same epithelium into the embryonic tissue which goes to make up the jaw. The epithelium which dips down is called the enamel germ; by growth and extension it shortly becomes converted into a flask-shaped outline, resting upon the embryonic tissue and lining a cavity. Partitions are formed in this continuous, irregularly-shaped depression, so that there are differentiated ten small bodies in each jaw. At the same time a papilla forms from below which grows upward, and, in a short time, develops to form a complete mould for the enamel germ which comes to rest upon it, and forms its lateral and upper boundaries. This papilla is highly vascular, and is called the dentine germ. While this is going on the connective tissue around the primitive tooth differentiates itself to form an investing membrane for the tooth, called the dental sac. Osseous tissue is being formed all the time in the partitions between the primitive teeth, and finally we have the alveolus formed around the tooth-sac, "at first with wide openings which afterwards are narrowed, but so as to allow the contained sacs to cohere with the gum along the border of

the jaw" (Schäffer). We have now arrived at the time of birth, and it will be necessary to see what has become of the various tissues we have seen developing. The enamel germ, with its two layers, forms the internal lining of the dental sac and the enamel itself. The dentine germ has formed the dentine, the pulp-cavity of the tooth, and the beginnings of the fangs. The dental sac, enclosing the tooth, has itself two layers, an outer vascular connective-tissue layer and the inner one, part of the enamel organ, going to form the so-called cuticula. The alveolus has been formed by bony deposit with its opening quite wide (Fleischmann), wider than is necessary for the crown of the tooth to pass through. As far as the development of the whole jaw is concerned, this must be looked upon as disproportionately great for the small number of teeth, so that there is more than enough room for all the tooth-sacs and no crowding the one upon the other. The permanent teeth are formed, practically, in the same manner as the temporary, except that there the enamel germ is formed from the enamel germ of the temporary teeth, in the shape of a small sac which goes to its development in the same way as it did in the temporary tooth.

At the time of birth, then, we would have an individual tooth—let us take the lower central incisor—with the following topographical relations: Above, we find the tooth-sac, the submucous connective tissue, and the mucous membrane; on any other side we find the tooth-sac and bony substance. The tissues which interest us most are those that separate the tooth from the oral cavity. The tooth-sac is very thin, and offers very little resistance to the upward or downward growing tooth; the same can be said for the mucous membrane. The submucous connective tissue is comparatively thick, and is the only substance that can be taken into consideration as opposing the developing tooth, as the alveolar cavity has been shown to have a sufficiently large outlet. The force that causes the teeth to come through the gums is the calcification of the fangs. As a result of this calcification the tooth is elongated, and, enclosed as it is, room has to be made for this elongation. It is not surprising to find that the tooth is forced in the direction of least resistance, and, being everywhere surrounded

by cartilaginous and bony tissue except in the direction of the mouth, it naturally begins to move in this direction. We have seen, furthermore, that the resisting medium is the sub-mucous connective tissue. Let us go on and find how this resistance is overcome.

The force at work is long-continued slight pressure, and this causes atrophy of the mucous membrane. This begins to work at different periods, depending upon the development of the teeth; at birth it begins in the lower incisors, shortly after in the upper incisors, so that with the completion of the third month of life the molars are already beginning to have their roots calcified (Pierce, "American System of Dentistry"). The question, "When does dentition begin?" must be answered by "at birth," provided we are satisfied with considering the beginning of dentition as applied to the beginning of pressure upon the soft tissues. This, as will be seen, is perfectly logical, as nearly all the symptoms attributed to teething are supposed to be due to pressure. On account of the innumerable symptoms that have been pointed out it is impossible to state when teething does begin; it is not uncommon to find the eruption of teeth within a few days prophesied by wise persons who rely upon certain symptoms, and the teeth not forthcoming within as many months. It becomes a question then, When does teething begin? when the teeth begin to break through into the soft tissues, as answered above, or when the teeth make their appearance in the mouth? The latter is the one that can be used to greatest advantage for more reasons than one, not the least important being that the time between the appearance of the first and last teeth is longer and that we have some visual testimony of the process. It must be added, however, that very few would be willing to place the beginning of teething at the time of the appearance of the teeth, and, to a limited extent, they are correct, as certain symptoms frequently precede the eruption of a tooth; these are so ill defined, so varied, and the time of their manifestation is so various, that no reliance can be placed upon them.

(To be continued.)

THE RELATION OF DENTITION TO DISEASES
OF THE ALIMENTARY TRACT.

BY SAMUEL S. ADAMS, A.M., M.D.,

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It is now so generally admitted that the evolution of the deciduous teeth is a purely physiological process that further discussion of dentition as an etiological factor of the numerous ailments of infants would seem unnecessary. There are, however, so many intelligent physicians who join the multitude of credulous mothers in harboring the oldest theories and superstitions about dentition and its many dangers that silence would seem culpable. In fact, dentition seems to be their "Mascot" in time of need, and furnishes a diagnosis for all disorders from the mildest to the most fatal. By taking advantage of the "Law of Reflex Action," this class of thinkers is able to trace the effect to a cause, whether it be through the oral mucous membrane, just pushing it up in its endeavor to pierce it, or is some distance beneath it quietly forming. It pays no attention to the time and order of the eruption of the teeth, but is satisfied in thinking they are trying to reach the surface, cannot get through the gums until a way is cut for them, or, having once passed the barrier, are irritating the tender gingival structures. How singular that a physiological irritant applied to the terminal end of the fifth nerve should not only affect *its* central origin but also irritate remote as well as neighboring centres, thereby causing either the simplest transitory redness of the skin or the greatly-dreaded "second summer diarrhœa!" A still more singular circumstance is that the disorders of "teething" usually are preceded or accompanied by some indiscretion on the part of the mother in her own diet, if the infant is nursed, or in the quality or preparation of artificial food.

Of course, it is not claimed that nursing infants, whose mothers endeavor to restrict their diet, do not suffer from

derangements of the alimentary tract during the period of dentition; but in such cases the cause may be sought in some factor to be revealed by close investigation.

In order to determine the relation of improper feeding to disorders of the alimentary tract during infancy a number of data have been kept and will form the basis of the argument. The cases herein cited are not selected, but have been taken from the records of one service of the Children's Hospital Dispensary, and include those treated during the months of June, July, August, and September for the ten years from 1879 to 1888 inclusive. The cases are not limited to any class of disease of the alimentary tract, but include every kind and degree from the slightest erythematous inflammation of the mucous membrane of the mouth to the most fatal form of dysentery. The data in some of the cases are incomplete, owing to the ignorance of those bringing the infants to the service, to their intentional misrepresentation, or to the carelessness and indifference of assistants, who failed to realize the importance of keeping correct notes of cases. Enough points, however, may be culled from the statistics to aid materially in the work.

No uniform law can be established for the eruption of the teeth, for while a certain order is recognized it is far from invariable. So much depends upon social and individual peculiarities that the first tooth may appear at any time from the third to the seventh month, or, as will be seen later, may not have made its exit at the end of the second year. Although recognizing such variability, it must be evident that in healthy infants the teeth make their appearance in the following order: Central lower incisors at the seventh month; upper central incisors from eighth to ninth month; lateral incisors at tenth month; first molars at twelfth month; canines at eighteenth month; and last molars at twenty-fourth month. In conformity with this classification infancy has been divided into four periods,—viz., under six months; from sixth to twelfth month; from twelfth to eighteenth month; and from eighteenth to twenty-fourth month.

The method of feeding is also of great importance; consequently, inquiry was made to ascertain whether the infant was

nursed, nursed and bottle-fed, nursed and table-fed, bottle-fed, bottle- and table-fed, and table-fed. In many cases the disturbance was caused by giving some nicknack, fruit, or other indigestible article. In many others the dietary was so comprehensive that they could not be placed in any class.

CHART I.

Showing method of feeding infants under six months, and the number of teeth in each case.

Case.	White.	Colored.	Nursed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
1.....	1	...	...	...	...	...	...	0
2.....	...	1	1	...	...	...	...	0
3.....	...	1	1	...	...	...	...	0
4.....	...	1	...	...	...	...	...	0
5.....	1	...	...	...	...	...	...	0
6.....	...	1	1	...	...	...	...	0
7.....	1	...	...	...	...	...	...	0
8.....	...	1	...	...	...	...	...	0
9.....	...	1	...	...	...	...	...	0
10.....	1	...	...	...	...	...	...	0
11.....	...	1	1	...	...	...	...	0
12.....	1	...	...	...	...	...	...	0
13.....	1	...	...	...	...	...	...	0
14.....	...	1	...	...	...	...	...	0
15.....	1	...	1	...	...	...	...	0
16.....	...	1	1	...	...	...	...	0
17.....	...	1	...	...	...	...	...	0
18.....	...	1	...	...	...	...	...	0
19.....	...	1	...	...	...	...	...	0
20.....	...	1	...	...	...	1	...	0
21.....	1	...	1	...	...	...	...	0
22.....	...	1	...	...	...	...	...	0
23.....	1	...	...	...	1	...	...	0
24.....	...	1	...	...	1	...	...	0
25.....	...	1	...	...	...	1	...	0
26.....	1	...	...	...	...	...	...	0
27.....	1	...	...	...	...	...	...	0
28.....	...	1	...	...	...	...	...	0
29.....	...	1	...	...	...	...	...	0
30.....	...	1	...	...	...	...	1	0
31.....	...	1	...	...	...	...	...	0
32.....	...	1	...	...	...	...	...	0
33.....	...	1	...	1	...	...	...	0
34.....	...	1	1	...	...	...	...	0
35.....	...	1	...	1	...	...	...	0
36.....	...	1	...	...	1	...	...	0
37.....	...	1	1	...	...	...	...	0
38.....	...	1	...	...	...	1	...	0
39.....	...	1	...	...	...	...	...	0
40.....	1	...	...	1	...	...	...	0
41.....	...	1	...	...	...	...	...	0

CHART I.—*Continued.*

Case.	White.	Colored.	Nursed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
42.....	...	1	...	...	...	...	...	0
43.....	...	1	...	1	...	...	...	0
44.....	...	1	...	...	1	...	...	0
45.....	...	1	...	...	1	...	...	0
46.....	...	1	...	...	...	1	...	0
47.....	...	1	1	...	...	...	...	0
48.....	...	1	1	...	...	...	...	2
49.....	...	1	1	...	...	...	...	2
50.....	...	1	...	...	...	1	...	0
51.....	...	1	...	...	...	...	...	0
52.....	1	...	...	1	...	...	...	0
53.....	...	1	...	...	1	...	...	0
54.....	...	1	...	...	...	...	1	0
55.....	...	1	1	...	...	...	...	0
56.....	1	...	...	...	1	...	...	0
Totals.	14	42	13	5	7	5	2	4

TABLE A.

Showing method of feeding infants under six months.

	White.	Colored.	Total.
Nursed.....	2	11	13
Nursed and bottle-fed.....	...	...	...
Nursed and table-fed.....	2	3	5
Bottle-fed.....	2	5	7
Bottle- and table-fed.....	...	5	5
Table-fed.....	...	2	2
Method not given.....	8	16	24
Totals.....	14	42	56

In Class I.—under six months—there are 56 cases; of these 14 are white and 42 colored. It will be seen by reference to Table A that only 13 of the 56 cases were nursed, while 19 received supplemental food. It is also noticeable that 12 of the 19 received food from the table. Although the method of feeding is not given in 24,—nearly fifty per cent.,—it is fair to assume that a large proportion received supplemental food of such a varied nature that they could not be placed under any of the classifications adopted. Table-food seems to be the preferred article for the nursing as well as the bottle-fed infant. Two were fed exclusively upon table-food.

CHART II.

Showing method of feeding infants between six and twelve months, and the number of teeth in each case.

Case.	White.	Colored.	Nursed.	Nursed and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
1.....	...	1	...	...	...	...	...	...	3
2.....	...	1	...	...	1	...	...	...	2
3.....	1	...	...	...	...	...	...	1	0
4.....	1	...	...	...	...	...	...	...	2
5.....	1	...	...	...	...	...	...	...	0
6.....	...	1	...	...	...	...	...	...	0
7.....	...	1	...	...	...	...	...	1	8
8.....	...	1	...	...	...	...	...	...	2
9.....	...	1	1	...	...	...	...	...	2
10.....	...	1	...	...	1	...	...	...	0
11.....	...	1	...	...	...	...	...	1	0
12.....	...	1	...	...	...	...	...	...	0
13.....	...	1	...	...	1	...	...	...	2
14.....	...	1	...	...	...	...	...	...	0
15.....	1	...	...	...	...	...	...	...	2
16.....	...	1	...	...	...	...	...	...	2
17.....	...	1	...	...	...	...	...	...	0
18.....	...	1	...	...	...	...	...	...	0
19.....	...	1	...	...	...	...	...	...	8
20.....	...	1	1	...	...	...	...	...	3
21.....	...	1	...	...	1	...	...	...	2
22.....	1	...	...	...	...	...	...	...	0
23.....	1	...	...	...	...	...	...	1	8
24.....	1	...	...	...	...	...	...	...	0
25.....	...	1	...	...	...	...	...	...	2
26.....	1	...	...	...	...	...	...	...	0
27.....	...	1	1	...	...	...	...	...	0
28.....	...	1	...	...	...	...	...	...	0
29.....	...	1	1	...	...	...	...	...	0
30.....	...	1	...	...	1	...	...	...	0
31.....	...	1	...	...	...	...	...	1	0
32.....	...	1	...	...	...	...	...	...	0
33.....	...	1	...	...	...	...	...	...	0
34.....	...	1	...	...	...	...	...	...	0
35.....	...	1	...	...	...	...	...	...	2
36.....	...	1	...	...	...	...	...	...	0
37.....	...	1	1	...	...	...	...	...	0
38.....	...	1	...	...	...	...	...	...	2
39.....	...	1	...	...	...	...	...	...	0
40.....	1	...	...	...	...	...	...	...	8
41.....	...	1	...	...	1	...	...	...	1
42.....	1	...	...	...	...	1	...	...	0
43.....	...	1	...	...	...	...	...	1	2
44.....	...	1	1	...	...	...	...	...	0
45.....	1	...	...	...	1	...	...	...	0
46.....	1	...	...	...	1	...	...	...	2
47.....	1	...	...	...	...	...	...	...	0
48.....	...	1	...	...	...	...	1	...	0

CHART II.—*Continued.*

Case.	White.	Colored.	Nursed.	Nursed and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
49.....	..	1	..	..	..	..	..	..	0
50.....	..	1	..	..	..	..	1	..	0
51.....	1	..	..	..	..	1	..	..	3
52.....	1	..	..	..	1	..	..	..	0
53.....	..	1	..	..	1	..	..	..	2
54.....	1	..	..	..	1	..	..	..	0
55.....	..	1	..	..	..	..	1	..	0
56.....	..	1	..	..	..	..	1	..	0
57.....	..	1	..	..	..	..	..	1	0
58.....	..	1	..	..	..	..	..	1	0
59.....	..	1	..	..	..	..	..	..	5
60.....	..	1	..	..	..	..	..	..	0
61.....	..	1	..	..	..	..	..	..	4
62.....	..	1	..	..	..	..	..	..	0
63.....	..	1	1	..	..	..	..	..	0
64.....	1	..	..	..	..	..	..	..	0
65.....	..	1	..	..	..	..	1	..	0
66.....	..	1	..	..	..	..	..	..	4
67.....	..	1	..	..	..	..	..	..	0
68.....	..	1	..	..	..	..	..	..	0
69.....	..	1	..	..	..	..	..	1	0
70.....	1	..	..	..	..	..	..	1	0
71.....	1	..	..	..	1	..	..	..	0
72.....	1	..	..	..	..	1	..	..	6
73.....	..	1	..	..	..	1	..	..	0
74.....	..	1	..	..	..	..	..	1	0
75.....	..	1	..	..	..	..	1	..	0
76.....	..	1	..	..	..	..	..	..	0
77.....	..	1	..	..	..	..	1	..	0
78.....	..	1	..	..	..	1	..	..	0
79.....	1	..	..	..	..	..	..	1	0
80.....	1	..	..	..	1	..	..	..	8
81.....	..	1	1	..	..	..	..	..	4
82.....	..	1	..	..	..	..	..	..	0
83.....	..	1	..	..	..	..	..	..	0
84.....	..	1	..	..	..	..	1	..	0
85.....	1	..	1	..	..	..	..	..	0
86.....	..	1	..	..	1	..	..	..	0
87.....	..	1	..	..	1	..	..	..	0
88.....	..	1	..	..	..	1	..	..	0
89.....	..	1	..	..	..	..	..	..	4
90.....	1	..	1	..	..	..	..	..	8
91.....	..	1	..	..	1	..	..	..	0
92.....	1	..	..	..	..	..	..	1	2
93.....	..	1	..	..	..	1	..	..	0
94.....	..	1	..	..	1	..	..	..	0
95.....	..	1	..	..	..	..	..	1	7
96.....	1	..	..	..	..	..	..	1	8
97.....	1	..	..	1	..	..	..	..	1
98.....	..	1	..	..	..	..	1	..	2
Totals.	27	71	10	1	17	7	9	15	125

TABLE B.

Showing method of feeding infants between six and twelve months.

	White.	Colored.	Total.
Nursed.....	2	8	10
Nursed and bottle-fed.....	1	...	1
Nursed and table-fed.....	6	11	17
Bottle-fed.....	3	4	7
Bottle- and table-fed.....	...	9	9
Table-fed.....	6	9	15
Method not given.....	9	30	39
Totals.....	27	71	98

From Table B we learn that 10 of the 98 cases were nursed, while 49 received supplemental food and 41 of them table-food. In 39 the method is not mentioned. While only 10 were nursed, 15 were table-fed.

CHART III.

Showing method of feeding infants between twelve and eighteen months, and the number of teeth in each case.

Case.	White.	Colored.	Nursed.	Nursed and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
1.....	...	1	...	...	...	...	...	...	6
2.....	1	...	...	...	...	...	...	...	0
3.....	...	1	1	...	...	...	...	...	3
4.....	1	...	...	...	...	...	...	...	12
5.....	1	...	...	...	...	...	...	...	6
6.....	...	1	...	...	...	...	...	...	7
7.....	...	1	1	...	...	...	...	...	1
8.....	...	1	...	...	...	...	...	...	6
9.....	1	...	...	...	...	...	...	...	5
10.....	...	1	...	...	...	...	...	...	8
11.....	...	1	...	...	...	...	...	...	2
12.....	1	...	...	...	...	...	...	1	14
13.....	...	1	...	...	...	...	...	...	9
14.....	1	...	...	...	...	...	...	1	9
15.....	1	...	...	...	...	...	...	...	9
16.....	...	1	...	...	...	...	...	...	6
17.....	1	...	...	...	...	...	...	...	16
18.....	1	...	...	...	...	...	...	...	...
19.....	...	1	...	...	...	...	...	...	...
20.....	...	1	...	...	...	...	...	...	16
21.....	1	...	...	...	...	...	...	...	12
22.....	...	1	...	...	...	...	...	1	12
23.....	...	1	...	...	...	...	...	...	7
24.....	...	1	1	...	...	...	...	...	1
25.....	...	1	...	...	...	...	...	...	4
26.....	1	...	...	...	...	...	...	...	5
27.....	...	1	...	...	...	...	...	...	8
28.....	1	...	...	...	...	...	...	1	14

CHART III.—*Continued.*

Case.	White.	Colored.	Nursed.	Nursed and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
29.....	...	1	...	...	...	...	...	...	9
30.....	1	...	...	...	...	...	...	1	9
31.....	1	...	...	...	...	...	...	...	9
32.....	...	1	...	...	...	...	...	...	7
33.....	...	1	...	...	...	1	...	...	12
34.....	...	1	...	...	...	...	1	...	0
35.....	1	...	...	...	...	...	...	...	20
36.....	...	1	...	...	...	1	...	...	1
37.....	...	1	...	...	...	...	...	...	11
38.....	...	1	...	...	...	...	1	...	8
39.....	1	...	...	...	1	...	...	...	6
40.....	...	1	...	...	...	...	...	1	10
41.....	1	...	...	...	...	...	1	...	7
42.....	...	1	...	...	...	...	...	...	10
43.....	...	1	...	...	...	...	...	...	8
44.....	...	1	...	...	...	...	...	...	8
45.....	...	1	...	...	...	...	...	...	4
46.....	...	1	...	...	...	...	...	...	8
47.....	...	1	...	...	...	...	...	...	8
48.....	...	1	...	...	...	...	...	...	6
49.....	...	1	...	...	...	...	...	...	0
50.....	1	...	...	...	...	...	...	...	8
51.....	...	1	...	...	...	...	...	...	0
52.....	...	1	...	...	1	...	...	...	5
53.....	...	1	...	...	...	...	...	...	0
54.....	...	1	...	...	1	...	...	...	0
55.....	...	1	...	...	1	...	...	...	8
56.....	...	1	1	...	...	...	...	...	6
57.....	1	...	...	...	...	...	...	1	13
58.....	1	...	...	...	...	...	...	...	4
59.....	...	1	...	...	...	...	...	1	2
60.....	...	1	...	...	...	...	...	1	0
61.....	...	1	...	...	...	...	...	...	4
62.....	...	1	...	...	...	...	...	...	12
63.....	1	...	...	...	...	...	...	...	19
64.....	1	...	...	...	...	...	...	...	0
65.....	...	1	...	...	...	...	1	...	13
66.....	...	1	...	...	...	...	...	...	10
67.....	1	...	...	...	...	...	...	...	4
68.....	...	1	...	...	...	...	...	...	6
69.....	1	...	...	...	...	...	...	1	...
70.....	...	1	...	...	...	...	...	...	0
71.....	...	1	...	...	...	...	...	...	0
72.....	...	1	...	...	...	...	...	...	4
73.....	...	1	...	...	...	...	...	...	12
74.....	...	1	...	...	...	...	...	1	12
75.....	...	1	...	...	...	...	...	1	...
76.....	...	1	...	...	...	...	...	1	...
77.....	...	1	...	...	...	...	...	1	...
78.....	1	...	...	...	...	...	...	1	...
79.....	...	1	...	...	...	...	...	1	...
80.....	...	1	...	...	...	...	...	1	...
81.....	...	1	...	...	...	...	...	1	9
82.....	...	1	...	...	...	...	...	1	6

CHART III.—*Continued.*

Case.	White.	Colored.	Nursed.	Nursed, and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	No. of Teeth.
83.....	...	1	...	1	...	...	...	...	10
84.....	...	1	...	...	...	...	1	...	2
85.....	...	1	...	...	...	1	...	...	12
86.....	...	1	...	1	...	...	...	...	2
87.....	...	1	...	...	...	...	...	1	12
88.....	...	1	...	...	1	...	...	...	0
89.....	...	1	...	...	...	...	1	...	0
90.....	1	...	...	...	...	1	...	...	...
91.....	1	...	...	...	...	...	...	1	...
92.....	...	1	...	...	...	...	...	1	...
93.....	...	1	1	...	...	...	...	...	8
94.....	...	1	...	...	1	...	...	...	4
95.....	...	1	...	...	1	...	...	...	9
96.....	...	1	...	...	...	...	1	...	6
97.....	...	1	...	...	...	...	...	1	12
Totals.	27	70	5	2	7	4	7	23	591

TABLE C.

Showing method of feeding infants between twelve and eighteen months.

	White.	Colored.	Total.
Nursed.....	...	5	5
Nursed and bottle-fed.....	...	2	2
Nursed and table-fed.....	1	6	7
Bottle-fed.....	1	3	4
Bottle- and table-fed.....	1	6	7
Table-fed.....	8	15	23
Method not given.....	16	33	49
Totals.....	27	70	97

Table C shows that 5 of the 97 were nursed, and 43 received supplemental food, while the diet in 49 is not given. Thirty-seven received table-food, while only 11 had an exclusive diet of milk.

CHART IV.

Showing method of feeding infants between eighteen and twenty-four months, and the number of teeth in each case.

Case.	White.	Colored.	Nursed.	Nursed and Table-Fed.	Bottle-Fed.	Table-Fed.	No. of Teeth.
1.....	...	1	...	...	...	1	10
2.....	...	1	...	...	...	1	16
3.....	1	...	1	...	...	...	4
4.....	1	...	...	...	...	...	16

CHART IV.—*Continued.*

Case.	White.	Colored.	Nursed.	Nursed and Table-Fed.	Bottle-Fed.	Table-Fed.	No. of Teeth.
5.....	...	1	...	...	...	1	20
6.....	...	1	...	...	...	1	14
7.....	...	1	...	...	...	...	20
8.....	...	1	...	...	...	...	16
9.....	...	1	...	...	...	1	10
10.....	...	1	...	...	...	1	20
11.....	1	...	...	...	...	...	...
12.....	1	...	...	...	...	...	16
13.....	1	...	...	...	...	...	20
14.....	1	...	...	...	...	...	6
15.....	...	1	...	...	...	...	20
16.....	...	1	...	...	...	1	12
17.....	...	1	...	...	...	...	20
18.....	...	1	...	...	...	1	10
19.....	...	1	...	...	...	...	10
20.....	1	...	...	...	...	...	10
21.....	...	1	...	...	...	...	20
22.....	...	1	...	...	...	...	16
23.....	...	1	...	...	...	1	0
24.....	1	...	...	...	...	...	16
25.....	...	1	...	...	...	1	16
26.....	...	1	...	...	...	...	14
27.....	...	1	...	...	...	...	8
28.....	...	1	...	...	1	...	...
29.....	1	...	...	1	...	...	13
30.....	...	1	...	1	...	...	8
31.....	...	1	...	...	...	1	16
32.....	...	1	...	...	...	1	...
33.....	...	1	...	...	...	1	10
34.....	...	1	...	...	...	1	...
35.....	1	...	...	...	...	1	14
36.....	...	1	...	...	...	1	10
37.....	...	1	...	...	...	1	8
Totals.....	10	27	1	2	1	17	439

TABLE D.

Showing method of feeding infants between eighteen and twenty-four months.

	White.	Colored.	Total.
Nursed.....	1	...	1
Nursed and bottle-fed.....	...	...	...
Nursed and table-fed.....	1	1	2
Bottle-fed.....	...	1	1
Bottle- and table-fed.....	...	...	...
Table-fed.....	1	16	17
Method not given.....	6	10	16
Totals.....	9	28	37

Finally, Table D shows that 1 was nursed and 20 received supplemental food; and of these 20 only 1 received milk. It

will be warrantable to assert that the 16, in which the diet is not mentioned, received table-food in greater proportion.

By analyzing Tables A and B, ages at which the diet should be milk, we see that 23 were nursed, 1 nursed and bottle-fed, and 14 bottle-fed, while 53 had table-food.

By Tables A, B, and C* we learn that 28 were nursed, 3 nursed and bottle-fed, and 18 bottle-fed, while 90 had table-food.

As the eruption of the teeth is said to have such a powerful influence in causing digestive disturbances, it will be instructive to study the number of teeth each infant had at the time of entrance.

From Chart I. it would seem to be the exception for an infant to have teeth prior to the sixth month. Two are recorded as having two teeth respectively, and it is worthy of mention, both infants were nursed exclusively,—a strong point in favor of nursing.

TABLE E.

Showing the number of teeth in infants between six and twelve months.

No.	White.	Colored.	No.	White.	Colored.
1.....	1	1	7.....	...	1
2.....	4	12	8.....	5	1
3.....	1	2	None.....	15	49
4.....	...	4			
5.....	...	1	Totals.....	27	71
6.....	1	...			
Total with teeth.....				34	
Total without teeth.....					64

Table E shows the number of infants between six and twelve months having teeth and those without teeth; and it also shows the number of teeth that each infant had. Twelve white had teeth and 15 had none; and 22 colored had teeth and 49 were without them. Summing up, we find that 34 had teeth and 64—nearly two-thirds—had none.

* I have already expressed myself in favor of restricting the diet to milk until the eighteenth month. If, however, a more liberal diet is allowed it should be limited to farinaceous food. The infant should not be helped from the family table, as is so frequently done.

TABLE F.

Showing the number of teeth in infants between twelve and eighteen months.

No.	White.	Colored.	No.	White.	Colored.
2.....	...	7	14.....	3	1
4.....	3	6	16.....	1	1
6.....	3	9	20.....	2	...
8.....	2	12	None.....	2	10
10.....	4	8			
12.....	2	9	Totals	30	69
			Not given.....	5	8
Total with teeth.....					73
Total without teeth.....					12
Teeth not given					13

Table F shows that 23 white and 51 colored had teeth,—74 in all; 12 had none and 13 were not recorded. It will be seen that only 2 white infants had twenty teeth and that 2 white and 10 colored children were without teeth.

TABLE G.

Showing the number of teeth in infants between eighteen and twenty-four months.

No.	White.	Colored.	No.	White.	Colored.
2.....	...	...	14.....	2	2
4.....	1	...	16.....	3	5
6.....	1	...	20.....	1	6
8.....	...	3	None.....	...	1
10.....	1	6	Not given.....	1	3
12.....	...	1			
			Totals.....	10	27
Total with teeth.....					32
Total without teeth.....					1
Teeth not given.....					4

Table G is of more than ordinary interest, for of the 32 infants with teeth only 8—twenty-three per cent.—had 16, and 7—twenty-one per cent.—had 20; and 1 colored child was without teeth.

The following table shows the condensed statement of the cases.

CONDENSED STATEMENT.

Total number of cases.....	288
Nursed.....	29
Nursed and bottle-fed.....	3
Nursed and table-fed.....	31
Bottle-fed.....	19
Bottle- and table-fed.....	21
Table-fed.....	57
Diet not given.....	128

CONDENSED STATEMENT.

Total number having teeth.....	141
Total number not having teeth.....	131
Total number not giving data.....	16
	288

It will be more to the point to study the cases in which the diet is definitely settled. Hence by deducting 127, in which the data are not given, we have 161 cases with complete data. As I have previously expressed the opinion ("Encyclopædia of the Diseases of Children," vol. i. p. 338) that the infant's diet should be limited to milk until the eighteenth month, 21—being the number between eighteen and twenty-four months—should be deducted, leaving 140. In this last number there were 46 either nursed or bottle-fed exclusively, so that, strictly speaking, there are 94 out of 140 that received unsuitable food. As observation has shown that bottle-fed infants were sickened by imperfectly prepared cow's milk or one of the many popular "infant foods," they may be consistently classed as wrongly fed, which increases the number to 106. How appalling that 106 out of 140 infants should have been so injudiciously as well as injuriously fed!

TABLE H.

Showing the method of feeding infants, without teeth, under eighteen months.

Nursed.	Nursed and Bottle-Fed.	Nursed and Table-Fed.	Bottle-Fed.	Bottle- and Table-Fed.	Table-Fed.	Total.
16	...	17	13	14	13	73

From Table H it will be seen that, although the infants were without teeth, nevertheless, 44—or sixty per cent.—were partly or wholly nourished by table-food. If we deduct 11 nursing infants, who were under six months and were hardly expected to have teeth, we will have 70.96 per cent. without teeth fed from table-food. The only infant between eighteen and twenty-four months without teeth was fed exclusively upon table-food.

It being definitely settled that nearly seventy-one per cent. of infants without teeth were improperly nourished, and sought treatment for some disturbance of the alimentary tract, the question arose in the minds of those having supervision over them, whether it would not be more scientific to attribute it to a known factor—the indigestible food—than to a hypothetical one, the tooth still confined to its sac? The disturbances caused by indigestible or undigested food are well recognized

when applied to adult life, then why make an exception in the infant?

Again, in many "teething" infants the disturbance may be traced to indiscretion in diet of the nursing woman. Many honest and anxious mothers too frequently attribute ailments of their nurslings to dentition, while they continue to subsist upon the grossest food. This fact has been clearly demonstrated in numerous instances by restricting the mother's diet and the infant's ailment quickly ceased, and, too, without medication of either. Cabbage, turnips, watermelon, cantaloupe, and other vegetables and fruits not infrequently produce violent digestive disturbances in the nursling without any discomfort to the mother.

The histories of the cases herein cited unfold a tale of woe. More than once a "teething" infant—not yet three months old—was expected to receive nutriment for the support of life from an exclusive diet of "pot-liquor,"—the water in which cabbage and bacon has been boiled. Many sought advice for disorders of "teething," and requested lancing of the gums when there was no evidence of the formation of a tooth, quite overlooking the fact that the infant ate the family food.

It has been previously suggested that those classed under *bottle-fed* were not properly fed. The notes show that in many cases the food of the bottle-fed infant was an enigma. Improperly-prepared condensed milk, sour or foul-smelling cow's milk, one of the numerous foods, one of the farinaceæ in water, broth,—in reality a slop,—or crackers and tea was expected to nourish the infant while the supposed eruption of its teeth caused its ailment.

In order to emphasize the harmfulness of one of the substitutes for mother's milk the following interesting case is narrated:

I was called to see an infant, aged five months, that had been taking the homœopathic sterilized condensed milk. It had wasted to an extreme degree of emaciation, presenting the appearance of the last stage of cholera infantum. The mother, although she realized that the infant was on the verge of death, was loath to accept any other cause than that of "teething." Cow's milk had been tried but disagreed with

it, so this was ordered as being something new, and particularly applicable to such cases. Its digestion seemed to be perfectly normal, and my diagnosis was starvation. The fond parent yielded reluctantly to this suggestion and informed me that it had taken two cans of this spurious article every day. Fresh cow's milk was obtained and given to the voracious little one. This was retained. The following afternoon I was hastily summoned to this patient. Its family had become alarmed because it had slept so quietly, and imagined it was dying, when it was only enjoying the sleep usual to a well-fed infant. It continued to take properly-prepared cow's milk, and rapidly gained in weight.

A few days after this case was discharged my attention was called to a second, in about the same condition, which was taking the same article, and at the suggestion of the same physician.

The fact that disease of the alimentary tract occurs in those with teeth does not weaken the argument, for the first glimpse of the lower incisor seems to be a license for forcing upon the infant articles that neither its digestion can prepare nor its economy appropriate. I am at present attending three infants with dysentery. Neither has more than sixteen teeth, the youngest only six, but all are fed upon the grossest table-food.

In none of the cases was lancing practised, because the fault was always found, by close questioning, to be an error in diet rather than dental irritation.

Those advocating the influence of dentition in causing disease in infants may claim that the retardation of the eruption of the teeth in the cases reported should be charged to the constitutional diseases, from which dispensary patients so often suffer, rather than to improper feeding. Observation in this department has shown that infants with rickets or struma are more frequently affected by disorders which are the direct effect of exposure to cold than to the digestive disturbances, which are most frequent during the hot weather. Probably in a majority of the cases the unwholesome food caused the defective nutrition in summer which became manifest in winter as rickets.

It may also be claimed that race had its influence in causing

disease. By careful scrutiny it will be seen that, although more colored infants were treated, the proportion was greater in the white. However, it would seem at times as if the colored infant thrived upon a diet that would quickly kill his white neighbor.

After careful observation and study of the diseases of infants, during the period of dentition, I am free to assert that neither the evolution nor eruption of the teeth has ever been accepted as an etiological factor in any of them. I accept dentition as a purely physiological phenomenon which may be subject to perversion. I would not be dogmatic in the assertion that dentition is *never* a cause of disease, but such; indeed, has been my experience in pediatrics.

If those interested in this subject will pursue such an investigation they will eventually conclude that improper alimentation, and not "teething," is the most potent factor in causing the disorders of the alimentary tract of infants.

The best way to overcome the influence of the superstition is by emphasizing in our colleges the fact that dentition is a physiological process, that after-coming graduates may assist us in convincing mothers that the observance of the strictest regimen and diet during the period of dentition is the surest guarantee against "teething" disorders. To this end let us labor, and I doubt not that ere the ARCHIVES OF PEDIATRICS celebrates its first decade, a vast majority of intelligent mothers will look after the infant's diet, firmly trusting that the teeth will take care of themselves.

I cheerfully acknowledge the valuable assistance rendered by Dr. W. J. Dillenback, Resident Physician of the Children's Hospital, D.C., in the preparation of the data used in this paper.

PHYSICAL EDUCATION IN CHILDREN.*

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It is my object in this paper only to call attention to the value of physical education in children for the prevention and cure of disease. But before this is done, it is best to consider very briefly the physical constitution of children.

Bones.—The bones of children are imperfectly formed. Many are semi-cartilaginous, while others consist of different segments held together by intervening cartilage. They are elastic and full of blood and fat. The periosteum is thicker than in adults and richly supplied with vessels. The connective tissue of young bone is tender, and hence has not as firm a union with tendinous and ligamentous attachments as is found in adults. The cartilaginous union of the shafts of bones with their epiphyses makes violent exercise dangerous, because it is likely to cause their separation.

Muscles.—The muscles of children are in less of a developmental state than bone, though the muscle-elements are not as firmly bound together as in adult bodies. Their nutritive supply is very liberal, and they are generally surrounded by a liberal layer of fat. They contain a larger proportion of water than those of adults, and therefore are not firm and hard.

Blood-vessels.—These are all relatively large in children and liberally supplied to nearly all parts of the body. They are more susceptible to impressions at this time of life than in later years. I mean that it is easier to develop them in childhood than in adult life, for they respond more readily to increased pressure and have a relatively better nutritive supply. Oxygenation in children is also better than in adults, because the freshly aerated blood has a much shorter distance to travel from the heart to the remotest parts of the body.

* Read before the Section on Pediatrics, Newport, June 25, 1889.

Nervous system.—While the nervous system is undergoing considerable development in children, it presents quicker reflexes than in adults, probably largely due to shortness of the peripheral nerves, thus consuming less time in the transmission of afferent and efferent impulses. But a child's nervous centres are more sensitive to stimuli and irritations, as is shown in their common reflex convulsions and febriculæ almost always readily controlled by the administration of nervous sedatives, notably the bromides. Shortness of limb, entirely aside from the rapid transmission of nervous impulses, is very conducive to the rapidity of movement so noticeable in children.

The viscera.—The largeness of the liver and the relatively small lungs are prominent anatomical features in the child. The stomach and intestines are proportionally large, causing a decided abdominal bulging. The viscera of the child have a softness and vascularity in marked contrast to the same organs in the adult. All in all, they are a much more delicate organism, and require a correspondingly greater amount of care.

Digestion.—The imbibition, digestion, and absorption of food in the child consists of a most interesting and important series of phenomena, without a thorough understanding and appreciation of which the proper physical education of children at any time is impossible. Too much stress cannot be laid upon this point, and it must always be remembered that no fixed dietary will do for any large number of children.

Growth and development.—The child is undergoing constant changes of growth and development, all its processes being generally more active than those of adults. The associations of its organs are new, and more apt to be impressed by external influences than in older organisms. What would produce a moderate effect upon an older organism might be powerful in its influence upon a younger one. Adult organisms undergo but little further development, while in children many changes have yet to occur. It follows, therefore, that more care must be exercised in the direction of children's exercises than those of grown men and women.

At first sight it does not appear that exercises can have much effect upon the growth of bone, but the facts of experi-

ence teach that it is so. The explanation is simple. Young bone is but a connective-tissue framework, filled with bone-cells, or osteoblasts, and cartilage, and this blends directly with the surrounding periosteum, thus forming a continuous, direct, and intimate fibrous connection of the periosteum and the entire interior of the bone. In the same way can muscles be described as consisting of a connective-tissue framework supporting muscle-cells and their vessels and nerves. This all-pervading connective tissue begins to predominate over the muscle elements as it nears the end of the muscle to become modified into a tendon. This tendon loses itself into the periosteum and bone, to which it is attached in very much the same way as its other end is to the muscle. Thus a muscle tendon is inserted into the very heart of the bone and not into its superficial layer as is so commonly and erroneously supposed and unfortunately too often taught.

From the intimate relations that I have indicated as existing between the connective tissue of bone and muscle and intervening tendinous structures, it follows that forcible or sustained muscular contractions that pull upon a bone act upon its deeper parts as well as upon its surface. It also follows that the depth at which this strain is felt in any bone depends upon the severity and duration of the force exerted.

It is a well-known law in physiology that increased functional activity of a part causes an increased supply of blood. Suppose now that a child is doing considerable exercise, and we have at once an increased blood-supply in its acting muscle and strained bone. If this is kept up for a long enough time, the increased blood-current leads to a higher nutrition of the part,—growth,—and should the bone be in the developmental stage, it will modify its development. As a proof of this effect of exercise upon bone I will only call attention to the readiness with which anatomists usually distinguish bones of the male from those of the female because of their larger size and the more decided markings of their ridges for muscular attachment. "This must have been a powerful man" is an expression often enough heard coming from teachers when looking over a skeleton with prominent ridges and tuberosities. In my paper on base-ball pitcher's arm I had the opportunity

to first call attention to the fact that bone-growth in the adult is caused by excessive exercise.*

My sole object in being so explicit about the effect of exercise upon bone is to show that it is a potential agent capable of doing either much good or harm according to its proper or improper application. With this example well in mind, it is hardly necessary to demonstrate the equally potential power of exercise upon all the other parts of the body, when it has been conclusively proven to have so decided an effect upon the nutrition and growth on as hard and unyielding and relatively passive a substance as bone.

Now, what are the general effects of moderate and violent exercise in health?

Moderate exercise in health.—When judiciously taken, moderate exercise, in ordinary health, increases the general nutrition of the body by increasing the heart's action, expanding the blood-vessels, increasing the secretions and excretions, and subsequently inducing tranquil and refreshing sleep. Besides this, it increases the vigor of the respirations, and thus the oxygenation of the blood. The body is pervaded by a healthy glow that remains for several hours and is followed by a feeling of added strength without any subsequent reaction.

Violent exercise in health.—By violent exercise I mean any physical work that is felt as a decided tax. All such is sure to induce local congestion at the seat of strain, and if persisted in will cause inflammation and hypertrophy. None of the organs subjected to these strains escape this inevitable result. On the young, it may even cause epiphyseal separations, tearing of the periosteum, and rupture of muscle. It follows from this that moderate exercise is better adapted for general use among children than the more active and dangerous variety. For some purposes, though, the latter is the more desirable, but it must be used with caution.

Therapy of the exercise of children.—Under this head I wish simply to mention some of the circumstances under which it is possible to benefit children by exercise, either instead of or in conjunction with other means. Of these condi-

* Medical News, July 16, 1887.

tions one of the most prominent and important are *spinal curvatures* not dependent upon osseous disease. Several plans for relief of this class of cases are now in vogue, but all seem to me more or less seriously defective. It is very generally, and I believe justly, supposed that these curvatures result from muscular weakness. Yet one plan is to treat them by a fixed plaster jacket or by metallic braces. The defect of this treatment is that while it may hold the column straight, it does not strengthen the weak muscles which should be able to hold the column in its proper position. Another method is to prescribe certain exercises that will develop certain muscles until they are strong enough to obliterate the curves by their contraction. This plan is also defective in that it develops only certain muscles while others equally as important are overlooked. Sufficient success may, and often does, result from such treatment in so far as it pleases the patient by evident improvement. But the physician's work does not stop at this point. His business is to permanently restore abnormal conditions to a normal state. Special development of certain muscles does not do this, for by following such a plan one simply replaces one deformity by another. No treatment of deformities by physical exercise is devoid of serious error that does not effect the symmetrical development of the body.

For instance, in a dextral dorsal curvature, due to muscular feebleness, the fashionable physical culture treatment now in vogue would compel the daily exercising of the muscles of the left side of the chest, for the purpose of pulling out the ribs and reducing the concavity of the spine of that side. So far the utility and correctness of this treatment cannot be assailed, but it practically stops at this point, or with a few additional exercises, causing a bending of the trunk so as to antagonize the objectionable curve. The method is defective by omission. Of what avail is it to have a straight spinal column with muscles on one side much stronger than those on the other? A muscular deformity succeeds one that was bony. This is not all, for in the course of time the stronger side predominates and the curve returns, but is the reverse of what it was in the former instance. What is absolutely requisite to a permanent cure is general exercise for both sides, and a few supplementary exercises to

help reduce the deformity without unnecessary delay. These may be of the calisthenic variety, or by means of dumb-bells, clubs, or pulley-weights. I prefer the last at all times when convenient. A suitable machine can be obtained for the moderate sum of ten dollars. I consider Reach's "O K" machine by all odds the most useful in the market, and it is the cheapest, especially when one takes into consideration the numerous exercises to which it can be adjusted.

A lady who has just left for her home was under my care for a week, receiving instructions in calisthenic and pulley-weight exercises for two purposes: one series to antagonize a dorso-lumbar curve, and the other to equally strengthen all the muscles of her back, and thus enable her to hold herself as erect as was intended by nature. She has a machine at home, and will continue her work until it is no longer needed. In her case the cure will be permanent. Had she received instructions in only those exercises which antagonize her curves, she would have made a temporary recovery only to lapse into a reversed curvature.

Club-foot, due to muscular weakness, as in cases due to anterior poliomyelitis, are best treated with special exercises. One plan is to have such a club-foot in leather and steel, thus forcing the foot into proper position without any direct effort to regenerate the lost muscle-power. Everything is left to time and the curative powers of nature. But this is neither scientific nor for what the physician receives his pay. The muscles actually atrophy to such an extent while braces are worn that they can never recover their functions. Another method, most ingenious, less unsightly than the former, and somewhat better, though also defective, is that which uses the artificial rubber muscle. If I am not mistaken, this was introduced a decade ago by the ingenious Dr. V. P. Gibney, of New York. But the serious objection to the rubber muscle is that it also largely destroys the functional activity of the affected muscle, by doing for it all its work. The plan of treatment which I advocate in all such cases is to use the brace when it is necessary to guard against accidental dislocation. The patient should only wear them when obliged to be on the feet, especially in locomotion. The rubber muscle should be worn when braces are

not necessary and when for æsthetic reasons it is desired to hide the deformity, but at all other times the foot should be permitted to fall into a natural position while exercises are practised to develop the affected muscle. They should also be faradized while the cord should be moderately galvanized. I, of course, only refer to those cases in which all motive power has not been lost.

It has quite aptly been said that a child is a small savage undergoing civilization. It is irregular in its habits, and tends to gormandize, as well as eat and drink without regard to the wholesomeness of what is within its reach. Regular physical exercise teaches it system, care, and discipline. Many children have a defective digestion due to many causes, common among which are defective circulation, defective nervous force, and defective muscle-power in the stomach and belly wall. These are all remedied by proper exercise. Many forms of indigestion, we all know, yield kindly to suitable exercise, and in no class of individuals is this more so than in children.

Some children are morose, some have mental torpor, some are lazy, and so I could go on through a list of ailments referable to the tone of the central nervous system. Now, a fact that is still but little appreciated is that physical exercise is a nervous stimulant and tonic of the highest order,—in fact, I believe it to have no peer ; and this conviction is the result of a large unbroken series of practical clinical observations. I know of no better demonstration of this effect of exercise in sharpening the wits than that given by Dr. Hamilton D. Wey, in his reported experiments with series of dullard criminals in the New York State Reformatory, at Elmira. It has the same beneficial effect in improving the disposition. For I have seen many disagreeable children become cheerful and good-natured after becoming actively interested in a course of physical education. The exceptions are temporary and due to conceit growing out of distinctions earned by superior accomplishments in contests. As a rule this condition does not last.

Systematic physical exercise is impossible without personal cleanliness. Children who are brought up familiar with the gymnasium or track are clean and regular in their habits. To-

gether with a weak body there is nearly always associated a high degree of backwardness due to false modesty, and also considerable lack of confidence. Now these are almost invariably lost after one or two years of gymnasium and out-door athletic work. That this is a valuable change for those who in later years must fight the world's great battle cannot be gainsaid.

As physicians, we all know the objections to the customary drinking of intoxicants and the use of tobacco. Their employment is most positively conflicting with good athletic work of any kind. Any early physical training of children compels them, or at least urges them, to dispense with intoxicating drinks and any form of tobacco. This alone would be reason enough to justify a demand for the early physical training of our children if there were no other. No athlete can get along without fresh air and wholesome food. Therefore greater care in the acquirement of both these would inevitably result from proper physical exercise.

The Physical Education Society of Pennsylvania has so far directed its main efforts towards introducing into the public schools of the State a system of compulsory physical education. It now exists in some parts of the country, notably in Milwaukee, where the German Turners are doing so much good for the rising generation. It is confidently hoped that within less than another year Pennsylvania will be enrolled among those few States that have made a systematic effort at the physical as well as mental education of their children.

I can think of no better conclusion to this paper than by quoting from a former paper of mine upon this subject, and if I have interested those of the profession of this country whose special business it is to look after the welfare of the young sufficiently to obtain their aid in developing the physical remedy, physical education, I shall feel deeply gratified with the result of the labors of which this paper is the outcome.

1. The object is to develop the material body, and with it, of necessity, the mind and morals.

2. Like most potent agencies, it is much abused and far too little understood.

3. It absolutely forbids smoking.

4. It absolutely forbids the drinking of alcoholic or malt beverages.

5. It insists upon the necessity of regularity in living, especially as regards the time of sleeping, eating, exercise, and recreation.

6. It enforces a good substantial dietary that will never be forgotten.

7. It discountenances all kinds of vice.

8. It is rigid in discipline without seeming so to those disciplined, and develops implicit and willing obedience to advisers.

9. It has a marked effect upon the growth of the body and mind.

10. It develops to a high degree the valuable qualities of hope, confidence, courage, deference, obedience where proper, independence, perseverance, ambition, temperance, and determination.

11. It is, in short, the most valuable preparation of the young for the cares and trials of adult life, and aids young and old alike to ward off disease and mitigate its effects.

SALOL IN THE GASTRO-INTESTINAL DERANGEMENTS OF CHILDREN.

BY WALTER LESTER CARR, M.D.,

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WITH the increased knowledge of the part that micro-organisms take in the origin of disease, our attention has been directed to the treatment of morbid conditions by agents that will destroy these low forms of life, or at least interfere with their development and growth. The antiseptics that are used in surgical procedures have been given trials by internal administration, and some of them have earned a permanent place

in the treatment of diseases of bacteriological origin, as witness the administration of corrosive sublimate in diphtheria and of creasote in tuberculosis of the lungs.

More recently the condition of the alimentary tract in certain forms of catarrh has seemed to indicate, from our present view of the causation of these disorders of digestion, a trial of agents that will prevent the activity of micro-organisms. The advent of the synthetical drugs, especially of the carbolic acid series, has given an impetus to the treatment of disturbances of the alimentary canal sufficient to place us on a plane beyond that which we occupied when an opiate was considered the only drug to be used in a diarrhœa.

Physiological knowledge and pathological investigation are leading the way in the furtherance of a more advanced and scientific treatment of disease, and while every new drug does not deserve a permanent place in the Pharmacopœia, it at least merits our attention if its use produce any good effects. With the approach of the hot weather, a medicinal agent that will be of any service in relieving gastro-intestinal disturbances, especially in children, is worthy of our investigation.

Salol is one of the latest of the synthetical compounds that has been given to the profession for use in the disturbed functions of stomach and bowel caused by changes in the food, the result of the activity of the micro-organisms, as shown in the formation of ptomaines and other products of decomposition and fermentation.

Salol, or the salicylate of phenol, was discovered by M. V. Nencki. It is a white powder, with an aromatic odor, but no taste. It is insoluble in water, soluble in alcohol,* and slightly soluble in all organic fluids of an alkaline reaction.†

It is made by substituting one atom of hydrogen of salicylic acid by the radical phenyl.‡ Tate§ thinks that commercial salol contains thirty-six per cent. phenyl.

Administered by the mouth salol is probably not changed

* Paris Letter in British Medical Journal, February 5, 1887, p. 300.

† London Medical Record, November 15, 1887, p. 503, from Bulletin Général de Thérapeutique, September 15, 1887.

‡ Therapeutic Gazette, April 15, 1887, p. 245.

§ Pharmaceutical Record, March 15, 1887, p. 86.

until it reaches the small intestine, where it is split up by the action of the pancreatic juice into salicylic acid and sulpho-phenol, which are eliminated through the urine. "The production of this decomposition in the intestine will explain its value as a powerful disinfectant in intestinal affections." *

Lombard † makes mention of this action of the pancreatic juice on salol, and that the activity of the drug depends more on the quantity of the pancreatic juice than on the amount of the drug. He instances the fact that, if the pancreatic duct be tied and the juice be cut off from access into the intestine, the drug remains without effect. In pathological conditions, therefore, where the quantity of the pancreatic juice is increased or diminished, the physiological action of the drug will vary accordingly.

The elimination of the drug in the urine causes it to assume a brownish or a dark-brown color (carbolorin), which upon the addition of liquor ferri sesquichloridi changes to a violet shade.‡ Osborne § writes, "I have found ten grains to be the smallest single dose that would produce the slightest darkening of the urine, and that dose but rarely. I have obtained a distinct reaction in the urine after only one grain was taken, showing the positiveness of salol breaking up in the intestine into its constituents and distributing its salicylic acid through the organism."

The experiments made with salol in cultivation broths have led Dujardin-Beaumetz || and others to declare that salol is not an antiseptic, but it is probable that the negative results shown by salol in preventing bacterial development in tests are due to the insolubility and inertness of the drug unless broken up into its constituents.

The clinical value of salol in intestinal disorders appears to be uncertain, as observers are not agreed as to the effects obtained.

* Therapeutic Gazette, *loc. cit.*

† London Medical Record and Bulletin Général de Thérapeutique, *loc. cit.*

‡ Bielschowski, Therapeutische Monatshefte, 1887, p. 47.

§ New York Medical Journal, April 7, 1888, p. 376 *et seq.*

|| Therapeutic Gazette, October, 1887, p. 658.

Osborne* thinks that in twenty-two cases in which he gave the drug he did not have a single failure.

McCall† used it with success in a severe case of colitis, with bloody, mucous stools.

Vansant‡ reports eleven cases, two of them children, where the salol was administered, generally with bismuth, because of the gastric symptoms. All did well.

Goelet§ writes that the diarrhoea and dysentery of children in summer are more promptly relieved by salol than by anything else.

Brothers|| was not so fortunate, for of sixteen cases, all children, who afterwards reported only three were positively cured.

Eichberg,¶ after a trial of salol in various forms of intestinal troubles, but not in children, concludes that naphthaline is more efficacious in the same conditions.

During the past eighteen months the writer has made a trial of salol in thirty-five children who have been seen at the Out-Patient Departments of Bellevue and St. Mary's Hospitals. Unfortunately, it is impossible to give exact returns of these patients because the mothers of the children often failed to report after the first treatment. It may be assumed that they were not worse or they would have been brought back.

The drug has been used in all the disorders of the stomach and intestine common to children, but with the most success in the cases of acute gastro-enteritis caused by improper diet or from temperature changes.

The dose and the mode of administration vary somewhat in different cases; the preference being to give the salol alone unless there is some particular reason for combining it with another agent. If the symptoms are those of acute gastro-enteritis with the vomiting of milk, or of other food, and the movements from the bowels are ill-smelling, loose, and quite

* New York Medical Journal, *loc. cit.*

† St. Louis Medical Brief, November, 1888, p. 445.

‡ Philadelphia Medical Times, October 15, 1888, p. 53.

§ New York Medical Journal, August 6, 1887, p. 148.

|| Therapeutic Gazette, October, 1888, p. 713.

¶ Cincinnati Lancet-Clinic, February 25, 1888, p. 223.

frequent, the administration of salol, while maintaining perfect rest of the stomach and bowels, will be all that is required. Should the vomited material contain bile and the stools have a lumpy, clay-like appearance or be streaked with bile, the addition of a small quantity of calomel or of mercury and chalk will bring about a quicker relief. This may be explained, partially, by the effect of the mercurial on the obstructed ducts of the liver and pancreas.

When the movements of the bowels become frequent and the discharges serous, the effect of the salol, besides the neutralization of the disagreeable odor, seems to be almost negative. It is seldom that the watery motions are lessened by the salol unless given in combination with opium or bismuth.

In dysentery and severe colitis salol exerts very little control on the tenesmus and bloody passages.

The dose of salol will depend much upon the requirements of the case.

For children under six months one-half grain every two hours for three or four doses will be found sufficient; between the ages of six and eighteen months half a grain to a grain and a half; at two years a grain and a half to two grains will usually be efficacious. The drug is best dispensed combined with some inert powder. Children take it readily if it is placed on the tongue or in a spoon. It never, so far as the writer is aware, causes toxic symptoms or any of the irritation of salicylic acid.

Abstinence from food that would continue the irritation of the stomach is of the same importance in the employment of salol as in the treatment of all disorders of digestion in children.

The conclusions drawn after the use of salol indicate that it is an easily administered, safe drug in the first stage of acute gastro-enteritis in children, and in the more chronic forms of entero-colitis, accompanied by slimy, bad-smelling evacuations. In the acute condition it is necessary to keep the stomach at rest and administer two or three doses of salol within five or six hours. For the more chronic state of catarrh, it is best given in somewhat larger doses before meals. In frequent serous discharges and in colitis the salol does not produce the

same good results as in the cases mentioned above, and its effect is uncertain, not being so rapid or so sure as an opiate.

In dysenteric disorders it cannot be relied on.

It seems, then, that salol acts best in morbid conditions due to fermentation and decomposition in the stomach and upper bowel, and that it diminishes in power as it passes through the large intestine.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Snow: Rickets—its Prevalence in Buffalo and its Probable Influence upon the Death-Rate among Young Children. (*Medical Record*, June 15, 1889.)

The author has made careful studies of this disease both in this country and Europe. In England and on the continent he found the percentage of rickety children to be very high. Though the disease was very rare in this country some few years ago, it is now on the increase, due, the author believes, to our changed modes of life, our confined city dwellings, and increased cares upon the mothers of the children, which necessitate artificial feeding.

In the etiology the author gives artificial feeding first place, heredity he doubts, next come uncleanness, want of sunlight, bad air, and insufficient clothing. The chief difficulty with the artificial foods is too much starch and too little fat, earthy salts, or animal proteids. The disease is also modified by syphilis and scurvy. That rachitis is a general disease involving all of the tissues is evidenced in the blood by the extreme pallor, in the skin by the sweating, in the nervous system by convulsions and tetany, in the muscles by the languor and weakness, in the mucous membranes by croup, bronchitis, and diarrhoea, in the ligaments by yielding of spine and ankle- and knee-joints, in the osseous system by the bending of the bones. The bone-changes consist of increased absorption of osseous tissue, accompanied by the formation of an osteoid tissue incompletely calcified. The proliferation of cartilage-cells is increased, and the continuous absorption of bony tissue has the effect of enlarging the medullary cavities. The process heals by osteo-sclerosis, the bones becoming very hard and dense.

As regards the symptoms, the author says the disease may be most insidious in its appearance, the first symptom being obstinate constipation occurring at from two to four months of age. Accompanying or following this will be great restlessness at night, kicking off the bedclothes; the child will cry on being handled, as though tender. Soon the bone-changes become manifest in the swelling of the epiphyses at wrist and ankle, knee and elbow. Also changes in the skull, absorption of the occipital and parietal bones, producing cranio-tabes. The head becomes square and the anterior fontanel may not close till the third year. Dentition is late and irregular. In the thorax will be developed the rachitic rosary and the pigeon-breast. The lungs are small and often emphysematous. There may be posterior curvature of the spine. The bony pelvis also suffers. In the lower extremities the bones become curved in different directions. Associated with these bone-changes is enlargement of the liver and spleen and extreme muscular debility.

These children are late in walking, are mentally backward, and are liable to attacks of dyspepsia, diarrhoea, convulsions, etc., and succumb easily to any acute disease.

The author gives reports of twenty-five cases of rachitis among fifty-eight children examined, about forty per cent. These children were bottle-fed, or, if nursed, received starchy foods in addition. With three exceptions all the children were of foreign parentage. And besides presenting the usual symptoms of rickets, some of the children had complications, as abscesses, enlarged spleen, œdema of extremities, convulsions, etc. From his own cases and the reports of other institutions in Buffalo the author believes the disease to be very prevalent in that city and in all the large cities of the United States.

He discusses the question of dentition in rickets and quotes from several authorities, showing that dentition is late, and if the ninth month is passed without the eruption of a tooth, suspect and examine for this disease.

He also gives attention to the digestive and pulmonary troubles incident to the disease. It is his belief that the excessive mortality from cholera infantum and pneumonia in children under two years of age is in the great majority of cases due to rickets.

In the discussion of the treatment he pays particular attention to hygiene and alimentation; young infants must have breast-milk and the hours of feeding must be regulated, older children should be deprived of starchy foods, and given chiefly meat, eggs, milk, and cod-liver oil. As regards medication, he places little confidence in lime, phosphorus, or iron, but

obtains better results from fat, cream, and cod-liver oil. If the oil is vomited or causes diarrhœa, it may be given by innunction.

Riemschneider: The Dietetic and Mechanical Treatment of Gastro-Intestinal Catarrh in Infants. (*Jahrb. f. Kinderh.*, xxix. 1.)

The author expresses his preference for an anti-bacterial and mechanical treatment of this disease, and gives the results which he has obtained from the treatment of one hundred and forty cases by this method. He speaks favorably of the results obtained by washing out the stomach with Escherich's apparatus, and followed an irrigation with plain water by an irrigation with a three-per-cent. solution of benzoate of soda. A portion of the irrigating disinfectant solution was left in the stomach, and it was thought that good results from such a course were especially frequent in connection with acute catarrh of the small intestine. In addition to this other doses of benzoate of sodium were given, and a suitable change of diet was ordered. Indications for irrigation and for the use of anti-bacterial agents were furnished by the presence of abnormal processes of fermentation in the upper portions of the intestinal tract. Of the one hundred and forty cases which were tabulated, a quickly favorable result was obtained in eighty-nine, a slowly favorable one in thirty-one, and in twenty the result was a fatal one.

A. F. C.

Naphthaline in the Diarrhœa of Children. (*Jour. de Méd.*, February 3, 1889.)

Naphthaline may be given to children in the first period of life in doses of ten centigrammes every two hours. Pure naphthaline never causes any accidents, even when used in very large doses. The following formula is recommended:

R Naphthaline, 2.00 to 4.00 grammes;
Sacchari albi, 2.00 to 4.00 grammes;
Bergamot ess., .03 gramme.
Sig.—Ft., pulv. et div. in chart. no. xx.

Naphthaline may also be given per rectum, in a mucilaginous mixture which will hold it in suspension, but will not dissolve it. The results will be the more satisfactory the earlier one begins with the treatment. Naphthaline also gives excellent results in cases of infantile diarrhœa produced by putrid or infectious agents. According to Bouchard, naphthol is superior in its action to naphthaline. Powdered charcoal has also been proposed for the disinfection of the intestine, and, if used, it should be given in pretty large doses.

A. F. C.

Pascual: Pathogenesis and Treatment of Intestinal Catarrh in Children. (*Anales de Obst. Gin. y Ped.*, January, 1889.)

This paper was communicated to the recent Spanish Medical Congress. It concedes to hygienic influences the greatest importance, as well those which pertain to the alimentary regimen as those which refer to climatic influences. The pharmacological therapeutics of infantile intestinal catarrh may be either symptomatic or palliative. The insoluble basic salts of bismuth and calcium and the oxide of zinc are suitable for precipitation upon the walls of the intestinal tube. By such action they modify in a favorable manner intestinal excitability, conduce to the absorption of the digestive juices, and diminish the quantity of liquid in the discharges. If the discharges are acid, as the result of abnormal fermentation, these salts will act as absorbents, and neutralize the irritant topical action of the discharges. The carbonates of soda and potash, especially the mineral waters which hold them in solution, are efficient means for treating intestinal catarrh in its latest stages, when mucus and other substances interfere with the action of the intestinal juices, and thus retard or prevent absorption. Catarrh, which is caused by atony of the intestinal muscular fibre, in which there is difficulty in the intimate combination of the digestive fluids with the food, and which favors the development of gases and of meteorism, should be treated with gentian and calumbo, with tincture or infusions of the carminatives, anise, mint, etc., with mild ointments applied upon the abdomen, and with nux vomica, which is the most efficient of all agents for exciting the contractility of the intestine. The author has little confidence in the use of the various digestive ferments for this condition, especially for children. In the spasmodic or reflex diarrhœas, the stupefying narcotics, such as chloral and opium, the paralyzing narcotics, cherry laurel and the bromides of sodium and potassium, should be given alone or in combination, to calm the peristaltic excitation of the intestine. Emollient fermentations and cataplasms, with or without opium, and sinapisms, are useful in acute intestinal catarrh. If the catarrh involves the large intestine, enemata should be given which may contain albumen, or also bismuth and opium. In intestinal catarrh, which is due to errors of diet, ipecac or the saline purgatives may be given to shorten its duration.

A. F. C.

Ballard: Causation of Mortality from Diarrhœa. (*Lancet*, May 4, 1889.)

It has long been known that a high atmospheric temperature

conduces to a high diarrhœal mortality. But a far more important condition is the temperature of the earth. By means of many experiments, it has been found that the summer rise in diarrhœal mortality does not begin until the mean temperature recorded by a four-foot earth thermometer has attained somewhere about 56° F., no matter what may have been the temperature either of the atmosphere or the earth recorded by a one-foot thermometer; and hence it happens that, although atmospheric and surface temperature may have abated, diarrhœa is maintained so long as the much more slowly diminishing temperature of the earth, at a depth of four feet, is maintained.

It is found that dwelling-houses having their foundation on solid rock, with little or no superincumbent loose material, have a diarrhœal mortality which is almost unnoticeable, and this even in the presence of conditions otherwise unfavorable. A loose soil, permeable by water or by air, is the soil on which diarrhœa mortality is apt to be high, and, other things being equal, the extent of the evil seems to be largely dependent on the extent of this permeability. The presence of organic matter in soils operates prejudicially, and this even when it is not of an excrementitious character.

Excessive wetness and complete dryness of soil appear to be unfavorable to diarrhœa. Habitual moisture not sufficient to preclude free admission of air is very favorable to diarrhœa.

Density of population is especially favorable to death from diarrhœa among infants; this is especially true where density of buildings on area restrict the movement of air about dwellings. The same lack of free movement of air within buildings acts prejudicially.

General dirtiness, darkness, and stagnation of air operate to raise diarrhœal mortality. Social standing does not affect the question. It has not been found that polluted water operates to produce this special form of summer diarrhœa.

With respect to food, it depends not so much upon the actual food, proper or improper, as upon some extraneous substances in them, which by itself is an efficient cause of the malady.

Children fed solely on the breast are remarkably free from summer diarrhœa. Of all forms of artificial feeding "the bottle" is the most dangerous, and infants suffer from diarrhœa just in proportion as artificial feeding takes the place of breast-milk. Maternal neglect and illegitimacy, while generally unfavorable to infant life, tend specially to diarrhœal mortality.

The Unequal Growth of Children. (*Brit. Med. Jour.*, February 2, 1889.)

It is sometimes assumed that the growth of children is continuous and uniform in quantity; it is, however, a matter of observation that this is not the case. It has often been noted that the increase of weight and height are inversely proportional. This fact has been further proved, as well as a relation between quantities of growth and seasons of the year, by observations made at Copenhagen, where one hundred and thirty children have been daily weighed and measured since 1884. The records of weight show a maximum period of increase, beginning in August and ending in December, followed by a mean period to the end of April and a minimum period to the end of July. The increase in height also shows three periods: The minimum, from the middle of August to the end of November, corresponds with the period of greatest weight increase; the mean period then extends to the end of March, while the maximum lasts from March to August, nearly corresponding with the minimum of increase of weight. It does not necessarily happen that such periodicity remains unchanged by external influences; the increase in height is often out of due proportion to the weight.

With these facts in view, the causes of mental differences, and inequalities of brain-action and constitution met with among children, are more readily appreciated and the absolute necessity of recognizing them in conducting the training and education of children.

Ophthalmia in Hanwell Schools. (*Brit. Med. Jour.*, February 16, 1889.)

The amount of ophthalmia in these schools of the Central London District is again attracting serious attention. They have never been free from the disease since 1858. There have been periods of alarming increase when energetic measures have been taken, but have never been carried out with sufficient thoroughness to eradicate it. During the last thirteen years two thousand six hundred and ninety-four cases have occurred.

There can be no greater mistake than the idea that the presence of ophthalmia is a necessary evil. With proper measures the disease can be eradicated, and if sufficient precautions are continued schools can be kept free from it. The fact must be faced that, owing to the extreme chronicity of the affection, and its contagious nature, it is utterly impossible to get rid of it quickly. Steady perseverance is required for at least two years. The only efficient way to cope with the evil is to

appoint a resident medical officer with special knowledge of the disease, whose whole time and energy shall be directed to its eradication. Bad hygienic surroundings should be remedied; but the affection is a local one, and spreads by contagion, and hope must lie in the systematic and steady use of local remedies, and taking precaution to prevent secretions from the eyes of affected children coming in contact with those that are healthy.

Dakin: Treatment of Umbilical Hemorrhage in Infants. (*Lancet*, April 6, 1889.)

The author describes in this paper a method for arresting hemorrhage from the umbilicus in newly-born children.

It consists in underrunning the umbilicus arteries with a harelip pin or long needle, in the following way: In the intervals of taking breath, when the abdominal walls are lax, about an inch of the abdominal wall, exactly at the level of the lower edge of the umbilicus, is included between the thumb and finger.

At this point the hypogastric arteries can be felt to slip within the grasp. If the attempt is made even a quarter of an inch nearer the pubes the arteries will slip away, as they are too deep to be included in the pinch.

The pin is then passed beneath them. There is no danger of wounding the intestines, as these are pushed down by the tightly-opposed finger and thumb.

By experiments on the dead infant, the author has found the pin to enter the abdominal cavity about one-sixteenth of an inch.

The hemorrhage usually ceases at once; but if it comes from the vein, a figure-of-eight ligature about the pin will at once arrest it.

The two main points are to make sure the artery is under-run and not transfixed, and that the ligature includes all the umbilicus.

Tomkins: Diarrhœal Mortality. (*Lancet*, June 15, 1889.)

In the district investigated by the author, there was a low mortality from diarrhœal diseases in 1888, and this year was marked by absence of bright sunshine and high temperature, and rain was somewhat continuously present. Dr. Tomkins reverts to his former opinion, that the disease is largely dependent on the temperature of the soil, one foot deep having reached 60° F. Experiments showed that the organisms in the air were more numerous when diarrhœa most prevailed;

similar observations were made as to organisms in the soil. Dr. Tomkins is of the opinion that these microbes act as principal agents in the causation of the disease. How they act is unknown. It may be directly or indirectly by the manufacture of a virulent chemical poison.

II.—MEDICINE.

Money, Angel: Functional (Rachitic ?) Infantile Palsy. (*Brit. Med. Jour.*, January 12, 1889.)

The writer thinks there is a class of cases of spinal paralysis not due to obvious lesions and yet destroying faradic contractility. Unfortunately, so far the peripheral nerves have not been examined, so that we cannot be quite sure that they are healthy. Diphtheria was excluded. Three cases are reported, of which the following one is typical and perhaps the most interesting:

An infant of nine months was brought on account of "fits and weakness." The former seemed from the history to have been laryngismus stridulus. There was marked irritability of the face, especially about the mouth, on the right side, and of the tongue. Mechanical tapping caused decided contractions both in the tongue and orbicularis muscle.

Examination of the soft palate and throat with a spatula brought on an attack of child-crowing, so that there seemed no doubt but the laryngeal muscles and nerve centre were in the same irritable state as the facial and lingual.

The muscles of back and extremities were decidedly weak and limp; the palms and soles presented a slight overarching which was suggestive of tetany, though there was no history of such an acute attack.

The mechanical irritability of all the muscles was above the normal. Faradic contractility was present but diminished in the paralyzed limbs, though the test was not altogether satisfactory.

Four days later the child died in an attack of laryngeal spasm.

No gross lesion was present in brain or cord, and no microscopic lesion in the cord, which was carefully examined. The nerves were not examined. The ribs showed signs of rickets; there were no signs of syphilis.

In one of the other cases, not fatal, the paralysis was more general and involved face and neck; no response was elicited to a very strong faradic current. There was here an antecedent

history of spasmodic croup. The paralysis was not ushered in by any of the usual symptoms of poliomyelitis.

The cases are admitted to be still obscure in many points, but the author hopes by drawing attention to them that more light may be thrown upon them.

Money, Angel: Congenital Cerebral Syphilis. (*Lancet*, February 2, 1889.)

The patient, a boy, aged four years, was first seen at the age of eleven months, suffering from hydrocephalus. The skull was natiform, the nose-root depressed, the spleen enlarged, and the choroids showed signs of disseminated inflammation. The syphilitic taint was discovered in every member of the family. The boy improved and seemed almost well until two months before death, when left spastic hemiplegia developed. The loss of speech followed, with the development of right spastic hemiplegia.

At the necropsy the brain and dura mater were found to be adherent everywhere. The arteries were much diseased and also the brain-substance. The atrophy and sclerosis were most marked in regions supplied by the most diseased arteries. The dura mater was four lines thick in the temporal regions, and resembled a fibroma in structure.

The brain of a second case, that of a microcephalic child, showed atrophy and sclerosis of the left hemisphere without disease of the arteries or membranes, but yet of syphilitic origin. The child died at the age of sixteen months. The brain weighed fourteen ounces, and the head measured fifteen inches in circumference and ten inches over the vault. All the limbs were weak and spastic, but the left arm least so.

Evans, Julian: A Case of General Subcutaneous Emphysema following Aspiration of the Chest. (*Lancet*, February 2, 1889.)

The child, aged eighteen months, had been under treatment for broncho-pneumonia. The lungs had cleared except at the right base, where there was persistent dulness, with tubular breathing. A localized empyema being suspected, aspiration was attempted with a full-sized needle, just below the angle of the scapula. No fluid was obtained; the needle was withdrawn and the puncture closed with wool and collodion. Two hours later subcutaneous emphysema was found extending from the seat of puncture over the trunk. In eight hours it had reached its maximum, involving the whole trunk; it formed a prominent collar around the neck, caused puffiness of the eyelids, completely closing the right eye, and extended over

the whole head. The arms and legs were not involved, and there was no pneumothorax. After twenty-four hours the swelling began to subside, and in a fortnight had completely disappeared from the trunk. On the first two nights the temperature rose to 102° , but then fell to normal.

About two weeks later the child died unexpectedly from diphtheria. The autopsy revealed the following condition: the lower lobe of the right lung was firmly adherent to the chest-wall; it contained a large number of bronchi, dilated to the size of a goose-quill, extending from the main bronchial tubes in straight lines almost to the periphery of the lobe, and the pulmonary parenchyma between these was entirely converted into tough fibrous tissue. There were also many small tubercular deposits.

In aspirating, the needle had probably entered one of the dilated tubes; consequently, as the two pleural surfaces were firmly adherent, and the walls of the dilated bronchus rigid, a track was left leading direct from the main air-passages to the subcutaneous tissues, into which air was easily pumped by the slight cough that followed the puncture.

Coën: Diseases of the Uvula and their Influence upon the Voice and Speech. (*Arch. f. Kinderh.*, x. 1.)

Inflammations of the uvula may be caused by cold or by irritants to the mucous membrane of the mouth with consecutive inflammation of the pharynx, tonsils, palate, and nose. There are idiopathic inflammations, catarrhal, phlegmonous, and follicular, which are to be differentiated from the symptomatic diseases of the uvula, which include the involvement of that organ with measles, scarlatina, croup, diphtheria, and syphilis. In these diseases inflammation and swelling of the uvula not only accompany the general disease, but in measles, croup, and diphtheria the first symptoms appear upon the uvula and the soft palate, thus furnishing a valuable diagnostic factor. The clinical picture in acute catarrhal and in follicular uvulitis, when the inflammatory process invades the follicles of the mucous membrane, being followed by swelling and suppuration, is well known, and the same is true in regard to phlegmonous uvulitis. It is also well known that in cases in which the acute process is often repeated, or with individuals of certain diatheses, the acute stage passes into the chronic, and we then have the chronic catarrhal form of uvulitis. As in pharyngitis, those symptoms are here observed which form the clinical picture of granular uvulitis, hyperplastic inflammation of the glandular elements of the uvular mucous membrane. The ordinary result of chronic uvulitis is hypertrophy

and prolapse of the uvula, which result in a lessening or a loss of contractility and sensitiveness of the uvula. Other symptoms are the feeling of a foreign body in the throat, difficulty in swallowing, and attacks of suffocation at night. Disturbances of speech are observed in acute and chronic catarrhal uvulitis, and their consequences, hypertrophy, paresis, ulceration, and paralysis of the uvula. The pharyngeal, nasal, and oral spaces form the resonance chamber of the human voice, and only when all the accompaniments of these cavities work harmoniously are the harmonic resonance and *timbre* of the voice preserved. The uvula holds a twofold position in the formation of the voice and speech,—it is an organ for strengthening the voice and making it harmonious, and it is also a shut-off valve. The anomalies which follow pathological changes in the uvula consist in the fact that in acute, but more yet in chronic, catarrhal uvulitis the natural resonance of the voice gives place to a sound of a duller, heavier character. A nasal sound is given not only in the pronunciation of *m* and *n*, but also in that of all the other consonants. This is due to the fact that the normal functions of the organ are mainly destroyed. A pronounced nasal voice results from ulceration and perforation, or even destruction, of the organ by syphilis, the integrity of the resonant chamber being thus encroached upon, and an abnormal communication being also made between two cavities which should not communicate. The nasal voice in connection with paretic or paralytic conditions of the uvula and the velum is quite different from that which obtains in individuals with perforation or destruction of the uvula. The treatment should be local, and is sufficiently well known. There may also be a methodical gymnastics of the voice and speech, in order to excite the defective mobility of the uvula. If the defects or the destruction are permanent, obturators may be tried, with a view of relieving them.

A. F. C.

Krüger: *Tænia Cucumerina seu Elliptica in Human Beings.* (*Arch. f. Kinderh.*, x. 2.)

Of the *cestodea* (worms) which inhabit the human intestinal canal, only three species, as a rule, come under the observation of the physician,—*bothriocephalus latus*, *tænia solium*, and *tænia mediocanellata*. The remaining species—*bothriocephalus cordatus*, *bothriocephalus cristatus*, *tænia cucumerina*, *tænia flayopunctata*, *tænia nona*, and *tænia madagascariensis*—are seldom seen. Only a few cases of *tænia cucumerina* have been recorded. The infection-bearers and propagators of this parasite are the dog and the cat, a fact which was known to Linnæus, and caused him to name it *tænia canina*. He also believed in

its transmissibility to human beings, in which opinion he was sustained by some and opposed by others. The intermediate agent between dog and man, according to Lenckart, is the dog-louse. The eggs of the parasite pass out with the faecal discharges of the dog and adhere to his skin, where they are taken up by the lice and are transformed into cysticeroids. While biting for fleas and licking the skin, animals which have the cysticeroids thus get them into their mouths and they are swallowed and developed within the intestinal canal. Human beings are infected either by means of the tongue of the infected animal or their own hands. This parasite has only been observed in children between the ages of nine months and three years, which is partly due to the fact that such children are brought into closer relations with dogs and cats than older ones, and partly to the fact that their discharges are under observation more constantly than those of older children. The parasite seldom gives rise to any particular symptoms, according to Lenckart, though it may be present in considerable numbers. In the case which was seen by the author, however,—a girl, sixteen months old,—there was loss of appetite and constipation alternating with diarrhoea, also high fever and rapid pulse. Portions of worms were passed for several days, and, after a vermifuge had been given, the entire mass of the parasites was discharged. The author believes that the parasite was the cause of the symptoms in the given case, for the symptoms were like those which are associated with the presence of other cestodea; such symptoms are produced in dogs by the parasite; and after the parasite was removed all bad symptoms in the child disappeared.

A. F. C.

Hogg: Amaurosis and Strabismus from *Ascarides Lumbricoides*. (*Rev. Mens. des Mal. de l'Enf.* [abstracted], September, 1888.)

The author's experience during many years of service has taught him that strabismus in young children is oftener due to the irritation caused by intestinal worms than is taught in the books devoted to diseases of the eyes. It is only exceptionally, however, that one finds reflex amaurosis and strabismus in the same individual and due to the same cause. In a case which is reported by the writer a child three years of age suffered from three different kinds of worms,—oxyuris vermicularis, tænia, and ascaris lumbricoides. No similar case has been found recorded. When the writer was consulted by the patient for ocular trouble the ordinary symptoms of worms were absent; the sleep was not disturbed; there was no irritation of the nasal mucous membrane, no serious derangement

of the appetite, although the child did not care for meat, and the appetite was rather weak and capricious. The diet consisted mainly of milk, bread, and light pastry. The child was rather feeble physically, and moved from one place to another by the assistance of chairs; but the mother thought this was due to the blindness from which the child had suffered for a year or more. The child was also backward in its speech, having only a very limited vocabulary. When exposed to a strong light the balls of the eyes were turned upward, the iris being entirely concealed by the upper lid, and this, added to the persistent strabismus, entirely prevented an ophthalmoscopic examination. The writer's opinion was that all the child's troubles were due to the influence of worms, though others who saw the child did not share this opinion. Suitable doses of scammony and jalap were administered, and resulted in the ejection of a quantity of ascarides. Male fern was next administered, and was followed by the discharge of eighteen inches of *tænia solium*, and by additional segments a few days subsequently. Next fifteen centigrammes of santonine were given at night and a full dose of castor oil the following morning. The result was the expulsion of five or six large lumbrici. During the subsequent two weeks twenty or twenty-five lumbrici, from four to eight inches long, were also expelled. Two months later the child's sight had returned and the strabismus had disappeared. The other faults as to walking, speech, and intelligence had also undergone marked improvement.

A. F. C.

Jacobowitsch: The Prolonged Variety of Diphtheria and Laryngeal Perichondritis in Children. (*Arch. f. Kinderh.*, x. 1.)

Notwithstanding the enormous literature upon the subject of diphtheria, its nature, etiology, and treatment are still as undecided as they were when Bretonneau first gave the name to the disease. Though it has been described by many writers as an acute infectious disease which has but a short course, not a few cases have been recorded which, if they could not be called chronic, could at least be called prolonged. Extremely rare also, among children, is perichondritis laryngealis, and because of the comparative infrequency of both these diseases several cases are narrated, one in which false membranes were in the larynx forty-five days, the disease being also associated with perichondritis laryngealis; and two of the latter disease, caused, in one case, by a burn, and in the other, primarily, by diphtheria. Two other cases of diphtheria unassociated with perichondritis laryngealis are also recorded by the author, on

account of their long duration, one continuing forty-four and the other more than sixty days, and both resulting in a cure.

In regard to the treatment of diphtheria, the author knows of but three substances which have much effect upon the process,—perchloride of iron, sublimate, and oil of turpentine. Sprays of any suitable antiseptic are useful as adjuvants to the foregoing. The strength of the iron solution, whether used locally or internally, must be governed by the intensity of the disease process. In severe cases the author uses two to four grammes of iron to one hundred of water, and administers a dessertspoonful every two hours. The sublimate and oil of turpentine are used only by inhalation, atomization, and gargling. The sublimate was used in a one to one-thousand solution by atomization, and every two hours the same was gargled. If, after suitable trial, improvement did not take place, the turpentine was substituted. Necrotic tissue should be removed and diseased surfaces disinfected with solutions of biborate of sodium, chlorate of potassium, or benzoate of sodium.

The object of the physician should be not merely to find means whereby the false membranes may be dissolved, but means which will also neutralize the poison which circulates in the blood of diphtheritic patients. In order to accomplish this there must be clearer knowledge concerning the poison of diphtheria, and this remains to be revealed by pathological chemistry.

A. F. C.

Le Gendre: Herpetic Stomatitis. (*Le Concours Méd.*, October 20, 1888.)

This condition is a common one among children. Comby says, concerning the condition, that it may be localized in the buccal mucous membrane or it may be accompanied with herpetic formations upon the lips and pharynx. It may also be irregularly distributed over the tongue, the palate, the gums, the cheeks, and the lips. The stomatitis which accompanies the herpetic eruption may be evinced by salivation, redness, swelling of the gums, difficulty in mastication, and fever. The tongue may be heavily coated and the general appearance resemble that of the eruptive fevers. The herpetic points may be isolated or grouped upon the superior face, the edges, or the tip of the tongue. Ulcerations also appear as the eruption develops. Herpes of the mucous membrane differs from herpes of the skin. In buccal herpes there are vesiculations quickly followed by ulceration or erosion, while in herpes of the skin dryness quickly follows the vesiculation. With simple herpetic stomatitis there is engorgement of the submaxillary glands, salivation, and fetor of the breath, as

in ulcero-membranous stomatitis; but the ulcerations of the latter are chiefly located upon the gums, and differ in form and depth from those of the former, which show a preference for the mucous membrane of the tongue. The duration of herpetic stomatitis is not more than a few days, but it may be associated, in very young infants, with severe digestive troubles; suction is difficult and painful, and insomnia may be present. The food should be given from a glass or spoon, and the mouth should be washed at suitable intervals with an alkaline lotion.

A. F. C.

Lenckart: Concerning the *Bothriocephalus*. (*Arch. f. Kinderh.*, x. 2.)

The author holds the view of Braun, that the pike is the intermediate repository of the *bothriocephalus latus*. Braun found that in Dorpat and its surroundings ninety per cent. of the pike which he examined had in their flesh and intestines embryos (*Finnen*) in great numbers which were identical with those of the *bothriocephalus latus*, and that these, when given to human beings, cats, and dogs, produced within a month mature parasites. Nevertheless Küchenmeister does not accept all of Braun's statements, (1) because he does not believe that *bothriocephalus latus* can be completely developed in three weeks; (2) because the pike is not a sea fish, and is therefore not frequently met with in the coast provinces where *bothriocephalus latus* is most frequently found; (3) being a very bony fish, it is never eaten raw. In Küchenmeister's opinion the parasite is developed in the different varieties of the salmon,—an opinion which is shared by other authors. But the embryos of the parasite have never yet been found in the salmon, nor does it abound in regions where the salmon is abundant. Braun also affirms that the pike is, in many places, eaten almost raw. From its eggs also a kind of *caviare* is made in Dorpat and eaten in a salted condition. In this *caviare*, and in the smoked fish, embryos have been found by Braun. The pike is a cheaper fish than the salmon, and is much used by poor people in an imperfectly-cooked condition. Braun's experiments have also been repeated and confirmed by others. The cod and other fish may also serve as a medium for the development of the parasite.

A. F. C.

Thin, George: Researches concerning *Trichophyton Tonsurans* (Ringworm Fungus). (*Brit. Med. Jour.*, February 23, 1889.)

An elaborate series of experiments is recorded in thirteen tables. The results may be summarized as follows: 1. The

fungus will live when exposed to ordinary temperatures for at least eleven months. 2. It survives soaking in water for two days, hence washing with water of the head or clothes leaves its vitality untouched. 3. Prolonged contact with olive oil, lard, or vaseline has no effect upon its vitality. 4. Application of soapsuds for thirty minutes but slightly retards its growth. 5. The antiparasitic effects of weak strengths of white precipitate, citrine, and sulphur ointments is shown to be certain.

Hill, William: Diphtheria with Patches in Perineal Region. (*Brit. Med. Jour.*, February 23, 1889.)

The disease was supposed to have originated from the water-closet, which was untrapped and defective. The three persons using the closet were attacked, and no others. A boy, aged ten years, was the first victim; he died of pharyngo-laryngeal diphtheria. His sister, aged eight years, complained of painful micturition. The vulva was found swollen, and there were several patches on the labia. Diphtheritic membrane formed on the tonsils and spread to the lungs. Before death, which occurred on the eighth day, fæces escaped by the vagina, indicating perforation of the recto-vaginal wall. The father had a small eczematous patch over the coccyx which became painful and inflamed, and later, putrid and foul-smelling pieces of skin and slough came away on the poultices. He had no sore throat. Six weeks later he was attacked by paralysis, which passed away in two months.

Stolterfoth: Typhoid Fever with Unusual Complications. (*Lancet*, April 6, 1889.)

The patient was seven years of age. The boy presented the usual symptoms of typhoid fever when he came under observation, on the fourteenth day of illness.

Ten days later he had an attack of hemorrhage, losing one pint of blood. This was successfully treated by ergotin and opium, and ice externally.

Hemorrhages recurred a few days later, but not as profusely as before.

In the fourth week a strumous ulcer on the left middle finger became inflamed, and was rapidly followed by cellulitis of the forearm, with free suppuration. This was treated with free incisions and boracic fomentation.

In the seventh week respiration began to become difficult and stridulous, and, in spite of treatment, became so bad that, in the twelfth week, suffocation was imminent. The larynx was found swollen and œdematous, and some small ulcers were

seen on the vocal cords. Tracheotomy was performed, and the patient rapidly recovered.

The tube was permanently removed on the eighth day, and the wound was healed on the twentieth day following operation.

Out of two hundred and three cases treated at this infirmary, this was the only one having laryngeal symptoms that required treatment.

Money, Angel: A Case of Sclerema Neonatorum Successfully Treated by Mercurial Inunction. (*Lancet*, March 16, 1889.)

A female child, aged five weeks, had had since birth a patch of hard skin on the right shoulder about the posterior axillary fold, and another in the skin of the left parotid region.

The skin was hardened all over the back of the body, including the buttocks, shoulders, legs, and neck, when she came under the observation of the author.

The muscles were splendidly developed. The plantar reflexes and knee-jerk normal. The liver was normal but the spleen was enlarged. There was much sweating about the head. There was no cranio-tabes, but much dark-brown hair existed on the scalp and back. There was no evidence of syphilis in the parents.

The treatment prescribed was frictions over the indurated areas with sweet oil, plenty of warmth, and careful feeding with fresh cow's milk and barley-water, together with inunction of blue ointment every day into the skin of the abdomen. From the time the inunction was begun there was steady improvement, whereas prior to it the induration had steadily advanced, notwithstanding the other treatment.

The author does not regard the improvement under mercury certain evidence of syphilis. There was complete recovery in two months.

Owen: A Greatly Enlarged Spleen in Anæmia. (*Lancet*, March 2, 1889.)

At a meeting of the Clinical Society of Manchester, Dr. Owen introduced a case of enlarged spleen with anæmia in a boy who had been under observation about three years. Soon after the first visit the muscles of the soft palate became paralyzed. The tonsils and upper cervical glands became enlarged. The symptoms were considered to be the result of diphtheria. The spleen continued to enlarge until it reached the level of the umbilicus. Slight dilatation of the left ventricle occurred. A systolic apex murmur was made out. In this case great

improvement had taken place under the prolonged use of iron and arsenic.

Whittle, E. G.: Laryngeal Growths in Children. (*Lancet*, March 2, 1889.)

The author discusses in this paper the various operations for removal of growths in the larynx, with the results of the operation when successful. Reference is made to the cause of aphonia following operation, to the varieties of papillomata, and to the probability of recurrence.

The history of a patient is given, aged three years, who had suffered from laryngeal obstruction from early infancy; the dyspnoea had been occasionally critical. Tracheotomy was performed and the child wore a tube for eight months. Then the larynx was opened by an incision made from the hyoid bone to the upper border of the cricoid. The larynx was opened in the median line and the alæ held open by retractors. A bunch of white fleshy growths were found attached to the inner wall, lying on and above the vocal cords, which were indistinguishable. The growths were intimately connected with the mucous membrane, which was somewhat damaged in their removal. The operation was complicated by the violent reflex movements of the larynx, which recurred as soon as the growths were touched, in spite of the free use of chloroform. The tracheotomy tube was worn for nearly two months, and then irregularly. The child speaks distinctly, though hoarsely, eight months after operation.

Finlay: A Peculiar Temperature in Tubercular Disease. (*Lancet*, March 2, 1889.)

The patient was nine years of age. Illness began six weeks previously, with malaise, headache, and loss of appetite. The symptoms following were: pulse about 80, respiration about 23; dry, coated tongue, sordes on lips; dry cough, scattered râles over lung, distended abdomen, and constipation. Later the bowels became loose and the movements offensive. The temperature-curve showed, with one or two exceptions, a low evening temperature and a morning rise, the former ranging from 96° to 98.4°, the latter from 99° to 103.4°.

The first impression was that the case was one of enteric fever; but after a few days the diagnosis of tuberculosis was made, chiefly on account of the peculiarity in temperature above referred to.

This conclusion was borne out by the post-mortem examination, tubercles being found in the peritoneum, lungs, pleuræ-

pericardium, spleen, and kidney. There was also evidence, in Peyer's patches, of previous ulcers, which had healed.

The author referred to the difficulty of differential diagnosis between tuberculosis and enteric fever, and the opinion was expressed that the inversion of the temperature-curve was a point of great importance, especially where, as in this case, it was so conspicuous and constant. Dr. Finlay does not hold that the temperature-curve is always inverted, but it is valuable when present.

Eade: A Case of Chorea followed by Erythema and Acute Rheumatism. (*Brit. Med. Jour.*, March 30, 1889.)

The patient was a boy who had not previously suffered from chorea or rheumatism, neither was there any rheumatism in the family. The muscles of the face and all the limbs were involved, and the intellectual power was decidedly diminished. On the seventeenth day the temperature, which had been normal, rose to 102.2° , and an erythematous rash appeared on the trunk, wrists, and knees, and on the following day the knees and ankles were red, swollen, and painful. A cardiac murmur rapidly developed. The temperature rose to 104° , the patient became delirious, the choreic movements increased, and the cardiac murmur became very bad. The erythema disappeared in five days. The joint affection rapidly subsided, and the cardiac murmur disappeared with great rapidity. The chorea subsided much more slowly, but had entirely disappeared at the time of his discharge, eight weeks after admission. At that time the abnormal heart-sounds were almost inaudible, and the intellectual power was entirely restored.

Jones, Talfourd: Gastric Diphtheria. (*Brit. Med. Jour.*, April 20, 1889.)

The following case is a unique one, as the condition is very rare. The diagnosis was confirmed by Sir William Jenner, to whom the morbid specimens were submitted. Other cases have been reported by Jenner, Fox, and Wilks.

The patient was a girl aged two years and ten months. On the third day after the appearance of membrane in the throat, there was difficulty in swallowing. On the seventh day there was vomiting of dark-red pieces of a membranous character, with a little blood. Death occurred on the eighth day.

At the autopsy a membrane was found on the tonsils, uvula, pharynx, and epiglottis, which extended into the larynx, but did not involve the trachea. The œsophagus was normal in every respect. The stomach was thickened and soft, and the interior presented a dark reddish-brown appearance. This

was found to be the surface of a continuous membrane, varying in thickness from one-twelfth to one-sixth of an inch, and being abruptly cut off at the cardiac and pyloric orifices. It could be peeled off in large masses, exposing the mucous membrane, which was thick and soft and of a dark-red color, without abrasion or ulceration. The rugæ were very dark, and studded with dark-red punctiform injections. Though the membrane in appearance and location bore many of the characters of a croupous revelation, it was beyond doubt diphtheritic.

Preliminary Programme of the American Pediatric Society, organized in Washington, D. C., September 18, 1888. The meetings will be held at the Army Museum Building, Washington, D. C., on the 20th and 21st of September, 1889. One of the afternoon meetings will be held in the Johns Hopkins Hospital, Baltimore, Md., by invitation of the Director of the Hospital.

PAPERS.

ADDRESS BY THE PRESIDENT.

A. D. BLACKADER, Montreal: "Notes on a Case of Ataxia in a Child of Ten Years."

W. D. BOOKER, Baltimore: "A Study of some of the Bacteria found in the Dejecta of Infants afflicted with Summer Diarrhœa."

DILLON BROWN, New York: "Noisy Respiration."

A. CAILLÉ, New York: "Prolapsus Recti due to Large Stone in the Bladder in a Girl Three Years Old." "Two Cases of Nystagmus associated with Choreic Movements of the Head in Rachitic Babies." "Septic Diphtheria with Unusual Sequelæ." "Personal Prophylaxis in Diphtheria."

CHARLES WARRINGTON EARLE, Chicago: "Subcutaneous Emphysema in Children." "The necessity of Prolonged Rest after some Attacks of Diphtheria." "Two Cases of Carpopedal Contraction."

J. HENRY FRUITNIGHT, New York: "The Treatment of Scarlet Fever and its Complications."

FRANCIS HUBER, New York: "Spurious Meningocele." "Double Empyema."

A. JACOBI, New York: "Aneurism in Early Life."

JOHN A. JEFFRIES, Boston (by invitation): "A Contribution to the Summer Diarrhœas of Infancy."

H. KOPLIK, New York: "Tuberculosis of the Testis in Childhood."

THOS. S. LATIMER, Baltimore: "Cases of Spastic Paraplegia."

I. N. LOVE, St. Louis: "Scarlet Fever."

ARTHUR V. MEIGS, Philadelphia: "The Artificial Feeding of Infants."

W. P. NORTHRUP, New York.

J. O'DWYER, New York: "Case of Diaphragmatic Hernia, with Operation." "The Apparent Physical Contradiction involved in the Reinflation of a Collapsed Lung while an opening remains in the Pleural Sac."

WM. OSLER, Baltimore: "A Case of Simple Muscular Atrophy of the Facio-Scapulo-Humeral Type." "Cerebral Sclerosis in Children."

A. SEIBERT, New York: "Diphtheria."

J. LEWIS SMITH, New York.

H. N. VINEBERG, New York: "Some Practical Points on the Diagnosis and Treatment of Malaria in Children."

V. C. VAUGHAN, Ann Arbor.

A. JACOBI,
President.

THOS. S. LATIMER,
Chairman Committee of Arrangements.

WM. D. BOOKER,
Secretary,
851 Park Avenue, Baltimore, Md.

The subjects to be discussed by men of such well-known ability indicate a successful scientific meeting, and it is to be hoped that all the members of the Society, with as many of their professional friends as possible, will be present. The November issue of the ARCHIVES OF PEDIATRICS will be devoted entirely to the proceedings of the Society at this meeting,—containing the president's address in full, a brief *résumé* of the papers read, together with a stenographic report of the discussions thereon.

III.—SURGERY.

Robinson: Strangulated Inguinal Hernia in a Child Fourteen Days Old. (*Brit. Med. Jour.*, September, 1888.)

There had been no movement since two days previously. There was vomiting: at first of the contents of the stomach and later stercoraceous. He was rather collapsed; the mouth was covered with aphthæ; the abdomen was very hard and

distended and apparently tender. On examination there was found a right inguinal hernia, very tense and hard, and irreducible. Chloroform was administered and taxis tried, but without avail.

Operation: When the bowel was exposed it was found to be of a deep purple color, but quite smooth and shining. It was quite easily reduced after division of the stricture. The next day the temperature was 102° F.; pulse 165; the abdomen was not hard or distended. On the second day the temperature was normal and there was no tenderness of the abdomen. In one week the wound was all but healed.

Warden, Charles: Fibro-Mucous Polypus of the Naso-Pharynx. (*Brit. Med. Jour.*, September 15, 1888.)

A boy, aged twelve years, had mucous polypi in both nostrils and a small growth hanging down from the roof of the soft palate and posterior surface of uvula. The duration of symptoms had been three years. These were removed, but recurred in one year. Later it was observed that the nasal polypi were connected with the other fibrous one. The tumors were again removed, under chloroform, by the electric cauterly and scissors. The growth, on examination, was of a dense fibrous structure. Under the microscope it was of fibrous tissue; the smaller appendages being distinctly mucous.

Unlike this case, fibromata of the soft palate are usually small and pedunculated and of slow growth.

As to the pathology of these tumors Panas has shown that the mucous membrane round the posterior nares and in the immediate neighborhood of these orifices presents a kind of transitional form between the mucous membrane of the nasal fossæ and the dense, closely-adherent, fibro-mucous lining of the pharyngeal vault.

Growth in these situations are composed to a great extent of the structural elements of the tissue from which they originate. This explains the character of the growth in this case.

Cameron, H. C.: Fungoid Tumors of the Neck removed from a Child. (*Glasgow Med. Jour.*, January, 1889.)

The child was six months old. There had been considerable hemorrhage from the surface of the tumor, so that its removal was deemed necessary. The tumor had evidently originated in, and been confined to, the skin of the back of the neck. The mother stated that on the site from which the tumor developed there had been at first a small mole or wart. Microscopically it was a round-celled sarcoma. Blood-vessels of an extremely embryonic type permeated the tumor, and in

part the cells were massed together with only a finely granular or fibrillar matrix. No pigment was discovered. The tumor was the size of a small orange, and ulcerated at the surface, but encapsuled at the base.

Cameron, H. C.: Ovarian Tumor removed from a Child. (*Glasgow Med. Jour.*, January 18, 1889.)

An ovarian tumor weighing three and a half pounds was exhibited. It was removed from a child three and a half years of age.

Microscopic examination showed it to be a round-celled sarcoma. The growth began three or four months before it was removed. The abdomen measured thirty-one inches at the umbilicus. Examination of the abdomen gave the ordinary signs of ovarian tumor. There was considerable ascites.

The most striking phenomena associated with the tumor were the evidences of changes such as occur at puberty. The mammae were enlarged and had a glandular feeling on touching them.

The labia pudendi were full and covered with a development of hair such as is seen in incipient puberty. The child died from shock following operation in such a way as to suggest bleeding from the pedicle, but it was found that there had been no bleeding. In the discussion the following points were brought out :

Great mortality has followed the removal of ovarian tumors in young children. Sarcoma is not rare in young children. Malignant disease of the ovary is so often associated with considerable ascites that it is a point of diagnostic value in differentiating between innocent and malignant disease of the ovary.

Collier, Joseph: Suprapubic Lithotomy in Children. (*Medical Chronicle*, January, 1889.)

In this paper the author reports, in detail, three cases of suprapubic lithotomy in boys, varying in age from four to nine years.

Two of the cases made an uneventful recovery; the others terminated fatally. This patient had been suffering from the same symptoms for three years. Post-mortem examination in this case showed the bladder thickened and increased in size. The left kidney showed well-marked hydronephrosis.

The right kidney was found to contain a large uric acid calculus in the pelvis and another, smaller, filling one of the calices. The rest of the calices were dilated and contained pus and offensive urine.

As to certain points in performing the operation, the author says that the rectal bag can rarely be required, since at this early period the bladder is rather an abdominal than a pelvic organ. It is only necessary to fairly distend the bladder with lotion. The catheter protruding suprapubically is a decided assistance. Attention is called to the mistake of thinking that the bladder has been reached when the brownish encapsulated pledges of fat that lie in front of it have been reached. If the loops of silk are passed into this only, the bladder would quickly sink back when opened.

Suturing of the bladder is distinctly advisable.

Bishop, E. Stanmore: Talipedic Shoes. (*Medical Chronicle*, January, 1889.)

The author gives a *résumé* of the different modes of treatment of talipes from the earliest writer down to the present method as it practically stands at present with reference to the use of shoes. The reasons of the different modes in which they are expected to act are given. He then goes on by a description of careful dissection to show the cause of the deformity and the changes in the foot in talipes varus.

In correcting the deformity the movement is that of a ball-and-socket joint. Abduction, extension, and rotation outward are all produced at one and the same time.

A shoe fitted with apparatus is described. The movement that effects these results is put into action by the effort to walk. When the shoe is on, the leg is still free for any treatment which may be thought advisable. The author concludes this interesting paper by stating that experience has proved that the shoe is easy and pleasant to walk in, and that its effects are really those which, theoretically, it might be expected to produce.

Jones, Robert: A Unique Congenital Tumor of the Back. (*Brit. Med. Jour.*, December 22, 1888.)

The child was six months old, with a congenital tumor, globular in form and about the size of a tennis-ball, situated on the back between the scapulæ. It was mostly soft, but from the most prominent part there projected a structure resembling a forearm, and bearing at its extremity three fingers with well-formed nails. Structures resembling a humerus and a scapula could also be felt in the tumor. If the case was one of foetal inclusion, it was almost unique as regards situation. It might be due to segmentation of the anterior limb,—a condition occasionally observed in the lower animals.

Page, Frederick: Suprapubic Lithotomy on a Boy: Primary Union of the Wound without Suture of Bladder. (*Brit. Med. Jour.*, January 19, 1889.)

The patient was eight years of age. The stone was the size of a hazel-nut, and was reached by forceps guided by the finger. The vesicle wound was not sutured, but the skin wound was closed with a continuous catgut suture, a small drainage-tube being left at the lower angle. A soft-rubber catheter was secured in the bladder. In four days the dressings were changed and found to be dry, and the tube was removed. On the seventh day the catheter was removed, when the urine passed normally. The child left the hospital on the tenth day.

Hartley: Tubercular Peritonitis Cured by Operation. (*Brit. Med. Jour.*, January 19, 1889.)

The patient was a child aged two and a half years, who was seen a year before suffering from an umbilical fistula, accompanied by the usual symptoms of tubercular peritonitis. An incision was made and the sinuses scraped out, much serous fluid escaping. The peritoneum was clearly seen to be covered with nodules. The wound healed and the child is now well.

Doran: Ovarian Tumors in a Newly-Born Infant. (*Brit. Med. Jour.*, October 20, 1888.)

Mr. Albert Doran exhibited to the London Pathological Society a pair of ovarian tumors removed after death from an infant which survived its birth only a few minutes. The abdomen was distended with ascitic fluid and the superficial veins were engorged. Each tumor consisted of a single cystic cavity surrounded by a thin wall composed of a highly-articulated tissue. The trabeculæ which traversed this tissue in all directions were composed of collections of round cells in a transparent matrix. The growth appeared to represent persistence and hyperplasia of the entire embryonic tissue of the parenchyma of the ovary rather than round-celled sarcoma, which, even when congenital, were in every respect of a different character.

Graafian follicles were found in the substance of the tumor, which therefore originated in the ovarian parenchyma and not in the hilum, but the tumor was clearly of extra-follicular origin. The cavities and the large central cyst appeared to be the result of breaking down of the tumor substance; they bore no epithelial lining. The tumors thus bore no resemblance to the common multilocular ovarian cyst. Each tumor looked like a cystic kidney when fresh.

Johnson, R. McKenzie: Tumor of the Naso-Pharynx. (*Brit. Med. Jour.*, September 15, 1888.)

A boy, aged thirteen years, suffered from difficult breathing and deafness. On digital examination of the posterior nares, a firm, smooth, oval mass was felt, apparently sessile and broadly attached above and behind, and about the size of a small walnut. It did not bleed, nor had it the feel of adenoid vegetations. The membrana tympani were much indrawn, and could not be inflated. The removal of the growth was attempted by the cold écraseur, but failed because of the sessile character. It was finally removed by cutting-forceps, under chloroform.

This case is a good example of the effects of these tumors upon the respiratory organs. Dry, unwarmed air, carrying irritating particles of dust and probably germs ordinarily detained in the nose, are carried directly into the lungs. The deafness complained of seems to have been the result of a purely mechanical interference with the function of the Eustachian tubes, and there was no evidence of any chronic inflammation of the canals or middle ear. The author has not been able to find any previous recorded case of adenoma in this site. Other authors say they are infrequent.

Potter: An Unusual Form of Intestinal Obstruction. (*Brit. Med. Jour.*, November 10, 1888.)

The child was five years old. The prominent symptoms were: the countenance pinched; pulse small and weak; abdomen flattened and specially tender in the right iliac region; temperature not elevated; vomiting, but not fecal.

Medical treatment was ineffectual; duration one week. Operation: chloroform. An incision was made from one inch below the umbilicus to two inches above the pubes. The large intestine was empty and the contents of the small intestine healthy. The objective signs of obstruction being absent, the abdominal incision was closed, carbolic catgut being used, which included the peritoneum. The patient died from collapse six hours after the operation.

Necropsy showed no signs of commencing peritonitis. When the intestines were removed and filled with water it was found that the ileo-cæcal valve was impervious. The lower few inches of the ileum were found to be the seat of enteritis; flakes of inflammatory lymph had agglutinated the edges of the valve to such an extent that, upon close inspection, only a pin-hole opening remained through which water could percolate drop by drop. There was no foreign body in the vermiform appendix, nor anything found in the intestine to cause inflammation of the mucous membrane.

Page: Accidental Self-Vaccination. (*Brit. Med. Jour.*, October 27, 1888.)

The author records a case in a child eleven years of age, who had been vaccinated when three months of age, but unsuccessfully. An infant of the same family was vaccinated. The elder child cared for the baby more or less.

On examination the left cheek was found much swollen, with a first-class vaccination vesicle near the centre. She remembered one day carrying the infant face downward over her left shoulder, and its arm coming in contact with her face.

Batchelor: Meningocele. (*Brit. Med. Jour.*, October 27, 1888.)

The child was born in the occipito-posterior position. About one month afterwards there was a fluctuating swelling about the size of a large marble situated at the upper angle of the anterior fontanel. This was said to have increased since birth.

Did the presentation cause a hernial protrusion of some of the contents of the skull; or did the forceps drawing the head through the bony pelvis in this unfavorable position expel some of the contents of the skull at a point of little resistance?

The author has lately seen another child with a solid tumor at the root of the nose. It had existed from birth. The diagnosis was nasal encephalocele. The mother gave a history of difficult and protracted labor. It is easy to understand how, in a face presentation, when the chin does not rotate forward and the head is born with the vertex in front, that the cerebral contents might be extruded, either at the root of the nose or at the nape of the neck, producing the nasal or occipital form of encephalocele.

Thompson: Intussusception of Three Weeks' Duration; Death; Autopsy. (*Brit. Med. Jour.*, Nov. 24, 1888.)

A case of ileo-cæcal intussusception in a child eleven months old. The symptoms extended over three weeks. A sausage-shaped tumor was felt in the left iliac region. The abdomen was distended but there was no rigidity of its walls. The stools consisted of blood, mucus, and a little faecal matter. The intussusception was felt per rectum. At the post-mortem examination general peritonitis was found.

The intussusception, which was hidden by distended bowel, occupied the left ilio-lumbar region, and curved across the abdomen just above the level of the umbilicus. The intussusception was adherent at its upper part to the intussusception; the latter was pervious.

Perforation of the bowel had taken place just below the intussusception.

Selections.

DISEASES OF CHILDREN.

Bacteria—their Relation to the Diarrhœal Diseases of Infancy.—Dr. L. E. Holt (*New York Medical Journal*) remarks,—

1. We accept, then, the doctrine that we are concerned most of all, in the gastro-intestinal disorders of infancy, with the development of abnormal bacteria, but as the first step there is a failure of complete digestion and perfect absorption.

2. Mechanical diarrhœa from the presence of foreign bodies, or food which acts as such to infantile digestion, and that resulting from the ingestion of poisonous ptomaines, are probably the only varieties to be excluded from this class.

3. The anatomical changes are those of inflammation of the gastro-intestinal mucous membrane; but the lesions of the results, either directly or indirectly, of the micro-organisms. Since micro-organisms are found in numbers only superficially, except where ulcers exist, it seems most likely that their action is an indirect one through their ptomaines.

4. As to the exact nature of the processes of putrefaction which take place in the intestine, and the bacteria which produces the different forms, we are as yet almost in entire ignorance.

5. One clinical form of diarrhœal disease—viz., true cholera infantum—has many features which point to a specific germ as a probable cause.

To what views of prophylaxis and treatment of intestinal disease does the foregoing discussion lead us? Time will not permit here more than an outline.

Two things are essential to active bacterial growth,—the entrance of living germs in numbers, and a proper soil for their development. Prophylaxis must have regard to both these conditions.

Germs are to be excluded by sterilized milk for all children under two years, by absolute cleanliness of bottles and everything with which the milk comes in contact, and by securing pure air. Tompkins found in Leicester, England, that in one section of the town where diarrhœal diseases were very prevalent there were from three to six times as many bacteria in the air as in other sections. The water-supply was the same for all, and the food not essentially different.

Equally important is cleanliness of the mouth. Van

Puteren found in infants suffering from thrush that the number of bacteria in the stomach was forty times as great as when this condition was absent.

To secure a soil unfavorable for bacteria we must have healthy digestion and absorption. This means a great deal. To secure it we must, in the first place, build up the infant's constitution; secondly, food suited to the powers of the digestive organs should be given; thirdly, regularity in feeding must be insisted on, and night nursing and feeding stopped as early as possible; fourthly, the stools should be inspected to see whether what is given is properly absorbed; fifthly, all minor derangements should be attended to; sixthly, during the hot summer season the amount of food should be materially reduced, and infants should be allowed water freely.*

As to treatment, three distinct indications present themselves:

1. To nourish the patient.
2. To combat the abnormal bacterial growth.
3. To treat the lesions.

All these indications must be considered if success is to be the result of our efforts. The force of the different indications may vary in different stages of morbid process; thus, early in the disease the second indication may be the most important, while later on the third indication comes into great prominence.

In all stages we have to deal with a very complex process, and its management will never, I think, be reduced to so simple a thing as the discovery of a pathogenic microbe and the giving of its appropriate germicide.

Cyanosis and Death of Infant.—Dr. Hitzrot (*ibid.*) was called, January 2, to see a woman said to be in labor. She had three living children and had had two miscarriages. Her former labors had been normal. Her family history was excellent. No syphilis nor epilepsy on her husband's side. I found that

* Under this last point I wish to call attention to an experience of Mr. David Little, of Rochester, N. Y., which he published in "The Transactions of the Medical Society of the State of New York," in 1884.

In an orphan asylum in his city where every previous summer had witnessed a number of deaths from diarrhoeal disease, he directed that infants should be fed at three-hour intervals during the day and should have nothing at night. Water was allowed freely at all times.

This season passed without a fatal case of diarrhoeal disease. At the close of the season he remarked to the sister in charge that the new rules of feeding had proved beneficial. She replied, "Yes, but it did seem rather cruel to feed the infants only three times a day." These were the directions as she understood them and as they had been rigorously carried out. The moral is plain.

she was not in labor, but was suffering with painful convulsive contraction of the muscular system of the whole body, with entire absence of uterine contractions. The pains occurred every twenty or thirty minutes. I considered them epileptic, and gave her full doses of the bromides, which controlled them while she remained under the influence of the drug. January 22, upon which day she had a series of attacks, she was delivered, after a normal labor, of an eight-pound male infant. She had a few attacks during the three following days, after which they recurred no more. She made a good recovery. The infant was of a natural color when born, but rapidly this became cyanotic, and then decidedly blue. He had a peculiar, plaintive whine which was constant. There was a slight bulbous enlargement of the finger-ends. The infant lived several hours, took a little sweetened water, but passed neither fæces nor urine. A post-mortem was not had. Whether the cyanosis was due to pulmonary stenosis, or to perviousness of the foramen ovale, is immaterial; the interest in the case centres upon the connection, if any, between the epileptiform convulsions of the mother and the anatomical cause of the cyanosis of the infant.

Tape-Worm in Children.—The following prescriptions will, according to the *Lyon Médical*, May 12, 1889, be found most effectual in cases of tape-worm occurring in children. Both are very agreeable to the taste, and are, therefore, easily administered :

I.

- R Oleoresin of aspidium, $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{ijss}$;
 Peppermint water, $\mathfrak{f}\mathfrak{z}\text{ss}$;
 Essence of anise, gtt. x;
 Chamomile water, $\mathfrak{f}\mathfrak{z}\text{j}$;
 Syrup of sugar, $\mathfrak{f}\mathfrak{z}\text{v}$;
 Syrup of bitter orange-rind, $\mathfrak{f}\mathfrak{z}\text{v}$.

II.

- R Oleoresin of aspidium, $\mathfrak{z}\text{j}$;
 Calomel, 6 gr.;
 Sugar, $\mathfrak{z}\text{ij}$;
 Gelatin, q.s.

Make into the consistency of jelly and administer as a confection.

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Original Communications.

THERAPEUTICS OF INFANCY AND CHILD-
HOOD.

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Diseases of Children in the College of Physicians and Surgeons, New York, etc.

(Continued from September Number.)

VI.—DISEASES OF THE DIGESTIVE ORGANS.

THE *tumefaction of the mesenteric glands* is of frequent occurrence. Its results are very serious, though the non-absorption of chyle does not depend exclusively on the functional incompetency of the glands. The latter has often been taken to be identical with the symptoms comprised under the name of *tabes mesenterica*, an error which I shall discuss in the second volume of Keating's "Cyclopædia." There it will be shown that the symptoms called by that name, and leading to emaciation and marasmus, are more frequently dependent on chronic peritonitis—mostly of tubercular nature—than on simple inflammatory hyperplasia of the glands. The latter can be more safely prevented than cured. Its original cause is mostly a simple diarrhœa. The irritation of a mucous membrane always leads to that of the neighboring glands; the glands near a nasal catarrh, a stomatitis, a diphtheritic process, a pulmonary catarrh, produce secondary adenitis. Thus the mesenteric glands near an intestinal catarrh are soon con-

gested, and begin to swell. Cell-proliferation accompanies the changed circulation; when its original cause—viz., the hyperæmia of the mucous membrane—has ceased, absorption of the newly-deposited material will always take place in the same way that the swelled glands of the neck will disappear when a nasal catarrh is treated with cleansing and disinfecting injections. As soon, however, as the newly-formed cells have been transformed into firm fibrous tissue, the possibility of absorption becomes less from day to day. Thus, the prevention of mesenteric glandular hyperplasia consists in the immediate removal of a diarrhœa. Be it ever so mild, it is always a morbid process. Be its name ever so innocent (for instance, “dental”), and the prejudice in favor of letting it alone ever so strong, it leads to anatomical changes in the mucous membrane and the glands which may become permanent. When a diarrhœa has been protracted, it may safely be assumed that the glands have undergone chronic changes. Then the cautious administration of an iodide, preferably sodium, is indicated, in daily doses of from five to fifteen grains, according to the age of the patient, the severity of the case, and the probable duration of the process. It must be continued for weeks, and then may be replaced by three daily doses of from five to twelve minims of the syrup of the iodide of iron.

Primary tuberculization of the mesenteric glands is quite rare; so is primary tuberculosis of the intestine, in spite of the fact that meat and milk containing the bacillus are known to be the occasional cause of tuberculosis of the bowels. Both are, as a rule, the results, or complications, of general tuberculosis, and in this way they, and tubercular peritonitis, are not uncommon. Thus, the treatment of tubercular tumefaction of the mesenteric glands forms part of the measures undertaken for the relief of the symptoms of the general infection, and leaves but little to hope. Still, there are cases in which the tubercular nature of the swelling cannot be doubted, that still are liable to get well. There are now on record a number of cases of peritoneal tuberculosis in which laparotomy was performed, either through a mistaken diagnosis or purposely, with relief for the symptoms, and apparent re-

covery. Indeed, there can be no doubt that a number of cases of peritoneal tuberculosis, in which the diagnosis was hardly doubtful, improved considerably, either under no treatment at all, or under measures calculated to benefit the general tubercular condition. Thus, even such cases permit of a hesitation to pronounce a fatal prognosis.

The conditions alluded to must not be mistaken for tumefaction of the mesenteric glands from other causes (for instance, primary lymphoma, the glandular enlargement of leucocythæmia or syphilis, or sarcoma which occurs primarily, or from carcinoma which is met with secondarily in young or older children). Lymphoma and sarcoma are positively improved by the protracted use of arsenic, in increasing doses, such as are discussed in a previous paper. Syphilitic swellings require the persistent administration of active doses of both mercurials and iodides.

In *perityphlitis*, which is a very frequent disease in childhood, absolute rest is required. The patient must use the bed-pan and urinal, and must not be permitted under any circumstances to change his position without being aided. The disturbance of an incipient peritonitis by mechanical causes is a serious matter; recent adhesions are very liable to be torn and give rise to new attacks. No purgatives must be given except a dose of oil in those rare cases where no evacuation has taken place for some time, and the accumulation in the colon of large quantities of feces is considered probable. In these cases, however, a large enema of soap and water will mostly fulfil all the indications. Thus, I am not prepared to advise, with a few modern authors, the universal treatment of perityphlitis (and peritonitis in general) with the sulphate of magnesium, or a large dose of calomel. The injection, however, first of a few ounces of olive oil, and afterwards of large quantities of soap and water, through a fountain syringe, is indicated after a week or ten days. Opium must be given freely by the mouth, rectum, or subcutaneously, in full doses. In almost every case ice applications must be made for days to the right hypochondrium. The food must be liquid, and given in small quantities at a time. The patient must remain in a recumbent posture for weeks after apparent recovery,

and be kept quiet even then, for an abscess may be capsulated and perforation may occur.

When the diagnosis is undoubted and the presence of pus can be safely inferred, there is no objection to an aseptic puncture, which may be repeated a number of times for the purpose of ascertaining whether there is pus or not. Sometimes there is but a small quantity of pus, which may not be easy to discover, but requires an operation. The indications for the performance of the latter are not easily found in many cases. Indeed, the opinions vary with the very best authors, a great many of whom have given the very closest attention and the very best thought to the subject, as to the best time in which the operation ought to be resorted to. Some recommend and practise the operation as soon as perforation of the vermiform process has taken place, some favor procrastination until the beginning of the second week. Besides, there are those who object to any operation when universal peritonitis has set in, and those who perform laparotomy in the very same class of cases. In a number of instances the time of the operation depends on the condition of the patient; immediately after the perforation of the gut collapse is sometimes so great as to render the operation absolutely inadvisable. In these ice, opium, and stimulants are required to bridge over the imminent danger until the operation can be safely performed. I have seen such cases in which it was considered positively fatal at first, and proved successful a week afterwards. There is no class of cases in which the responsibility of the medical man is greater, and great knowledge and keen judgment are more urgently demanded. Not every case terminates in suppuration. In some there is a great deal of inflammatory exudation. In them the protracted use of the iodide of potassium or sodium, lanolin ointments of the same, and occasional vesicatories will render good services. I have known many who had repeated attacks extending over years, and finally got practically well, not having anything to complain of for long periods.

After recovery, purgatives must not be given for a long time; but, as a matter of precaution, warm enemata must be administered every day.

As there is a difference between peri- and para-metritis, so

there are cases of *para-typhlitis* to be distinguished from *perityphlitis*. In these cases, local inflammation, exudation, and suppuration have nothing to do with the vermiform process. *Para-typhlitis* consists in an inflammation and suppuration in the copious connective tissue between the pelvis and the colon, which at that place is not covered by peritoneum.

Such abscesses are the result of trauma sometimes; not infrequently of pelvic abscess; inflammation of the psoas; caries of the vertebræ; sometimes no cause can be found. They will develop rapidly and become very large. The abscesses are so large that sometimes pints or quarts of pus will either be discharged spontaneously or be removed by incision. But suppuration will not always result from this inflammatory process in the connective tissue, but inflammatory exudation only. When this happens, the treatment consists in the internal use of the iodides, and the applications of ointments of iodoform or iodide and lanolin, or of iodoform collodion (1: 8-10) several times daily; cold-water applications which are kept up until they become warmed; or sometimes warm poultices, particularly in the cases of very anæmic children, will be found to be pleasant and useful.

Twenty-five per cent. of all the cases of *invagination* or *intussusception* of the bowels occur in the first year of life (two-thirds of them between the fourth and sixth month), and fifty-three before the end of the first year.* Thus, a knowledge both of the condition and the means to remedy it are essential to every person who has many children intrusted to him. The only successful treatment consists in the reposition of the intestine. When it has been accomplished the relief of all the symptoms is immediate. The anxious expression, pallor, and collapse improve instantly, the little patient goes to sleep, and soon takes food. In the commencement of my practice, when the invagination extended down to the rectum I employed large stomach sounds for the purpose of reducing the invaginated mass, but I have almost invariably found the case to be worse afterwards, because the sound will crowd the parts upon each other. I also used to blow air into the intes-

* See my "Intestinal Diseases," p. 242.

tine by means of bellows through a long tube; and in order to make the supply more regular I availed myself, twenty-five or thirty years ago, of an apparatus for the production of carbonic-acid gas. After that time, when the siphons containing carbonic acid and mineral waters were invented, I used them for the purpose of filling the intestine more or less slowly with both gas and water. All these measures have proved successful in occasional cases. What has rendered me better service, however, is the following simple plan: The baby is turned on its belly, the hips are raised, the abdomen gently supported by a soft pillow. The mouth and nose, being the lowest part of the body, must be protected. The baby is then anæsthetized with chloroform, and warm water is poured into the rectum with but little pressure. The injection is frequently intermitted, while the anus is closed by the finger. At the same time the abdomen, in the direction from below upwards, is gently kneaded and its contents moved about.

In not a few cases have I seen immediate result from this treatment in the course of the last twenty years. When reduction has been completed, the baby must be kept absolutely quiet, take opium, now and then a rectal injection of chloral in solution, and wear an abdominal bandage just tight enough to steady the bowels.

In adults, Kussmaul reports favorable results from washing out the stomach. When the simple measure which I propose is unsuccessful, after a number of trials, laparotomy ought to be performed. The successful cases of laparotomy are not very numerous, but sufficiently so to justify the operation as the only means that promises a favorable result in irreducible cases. The late Henry B. Sands saved a baby of six months by this operation, and there are other similar cases on record. It is necessary to operate in time, and not delay too long; for, at the best, laparotomy, in these cases, has its serious difficulties.

At an early period all the tissues involved are hyperæmic and soft, with a tendency towards gangrene. In a child of eight weeks, on whom I operated, it took me ten minutes to separate the parts from each other, although I had the invagination, measuring six or seven inches, outside of the abdominal

cavity. This delay was due to the softness of the tissues, the close impaction of the three layers, and the presence of a large amount of mesentery in the mass. Besides, the field of operation is very small and the difficulty of returning the intestine into the abdominal cavity very great indeed.

The medicines available for dislodging *intestinal worms* are all strongly irritant. They must not be given unless the diagnosis has been made positive. It is better that the diagnosis of a gastritis, enteritis, or meningitis, when present, should be made by the medical man than that the child should be punished for his carelessness. Before taking anything to expel tænia, a child ought to be in fair general condition. Moreover, its own tænia, the mediocanellata, is the most difficult to expel. The best time is when proglottides are seen in the movements. Moderate abstinence for days, and a purgative (castor oil), ought to precede the administration of drugs. The parasite must be expelled; for though the symptoms may not be urgent, some day there will come either local or reflected ones.

Spontaneous emigration will be noticed occasionally, but it is rare and not to be expected. After the successful termination of the cure the intestine must be allowed rest. The plainest diet, such as milk, and strained farinacea, and peptones, are indicated for days.

I have administered a great deal of kamala, sometimes ten to fifteen grammes (a quarter to one-half of an ounce), during one hour, early in the morning; the breakfast (milk) to be postponed for two hours. The effect was not uniform, and often negative. It was improved by giving a dose of twenty-five centigrammes to one-half gramme (four to eight grains) four or five times daily, for ten days or more, previous to the larger dose. A few hours after the larger dose castor oil ought to be given.

Kousso, four to fifteen grammes within two hours, after the required preparation, to a child of from two to ten years.

Extract of filix mas has proved most successful in my hands. A small child may take one gramme (fifteen grains) in an aromatic mixture within one early morning hour. A drachm is tolerated and required by a child of seven or eight years.

Pelletierin tannate is given in doses of one or three decigrammes (0.1–0.3 = grs. iss to v). I have but little experience with it. It is obtained from cortex punicæ granatum, which was (and is still) given as a decoction, but is too disagreeable and sometimes dangerous a mess for a child or infant.

For the removal of ascaris the general preliminary treatment ought to take place; at least, the bowels ought to be moved gently. The powdered semina cinæ, or flores cinæ, one gramme or more, mixed with a syrup, and followed by castor oil, will work well. Santonin, which is obtained from it, works as well and more pleasantly. From one to six centigrammes (gr. $\frac{1}{6}$ – $\frac{1}{2}$ –i) several times a day, with a purgative such as magnesia, calomel, or jalap. The latter addition is desirable, inasmuch as now and then poisonous symptoms may appear. Older children will complain of “xanthopsia,” yellow vision. Urine and conjunctivæ are yellow, sometimes.

As oxyuris vermicularis is frequently found in the rectum, or its neighborhood, the internal administration of drugs is not indicated. The external results, such as vaginal catarrh, must be treated locally. The worm is removed by a small piece of blue ointment introduced into the rectum, or rectal injections of vinegar and water (1: 3–4), corrosive sublimate (1: 1500–6000), or decoctions of onions or garlic. It is difficult to dislodge, as it also inhabits the colon and even the small intestine.

Anchylostoma duodenale has attracted a great deal of attention of late, and may become of more practical importance to us when the blessing of immigration from the parts where the worm is indigenous will go on as hitherto.

The male is from six to ten, the female from ten to eighteen millimetres in length ($\frac{1}{3}$ – $\frac{1}{2}$ inch). The mouth is bell-shaped; there are two dental prominences above and four below. Particularly the female is thus characteristically endowed, so that it sucks and bites at the same time. Eggs are found in the fæces. They are smaller than those of ascaris. It was found in large numbers among the Italian workmen of the St. Gothard tunnel, the tile laborers of the Rhenish provinces, and the Hungarian miners and their children. The cause of its presence is looked for in the muddy water they drink, which

is filled with the ova, and the clay they work in, which contains the larvæ. The general symptoms are very severe and dangerous,—debility, paleness, utter exhaustion as in pernicious anæmia, relative diminution of red blood-cells. This “Egyptian chlorosis” was explained by Griesinger by the presence of anchylostoma, as early as 1854. Besides, there is pain in the epigastrium, constipation, mucus and bloody discharges, sometimes real hemorrhages and dyspnœa.

Anchylostoma duodenale requires santonin, thymol (adults took two to ten grammes daily), and principally extract of filix mas.

Umbilical hernia is of very frequent occurrence, but seldom attended with danger. Incarceration takes place very rarely; still, Treves and others have reported successful operations for such accidents. As there is a predisposition to the development of this variety of hernia, so there is a tendency towards spontaneous recovery. The round umbilical aperture will normally change after a number of months, or even a year, into a narrow fissure, more fat will develop, the muscles will become stronger, and then the intestine will be retained within the abdominal cavity. To accomplish this still more certainly, it is desirable to retain the contents of the hernial sac inside the abdomen. For this purpose, trusses are very unavailing. Strips of adhesive plaster will serve very much better, but in most cases they are objectionable because they irritate the sensitive skin of the baby.

Whatever application is made to the hernia directly must be larger than the aperture. It should not be too hard. Linen compresses, and those of woven lint, plates of cork covered with linen or lint, may be applied and held in position by means of a bandage. Knitted bandages will suit better than the ordinary bandage of linen, cotton, or flannel.

Inguinal hernia in the newly-born or the very young is apt to recover spontaneously. When the short and straight inguinal canal becomes longer and more oblique, in the course of a few years, and the amount of fat goes on increasing, the rupture may disappear; but all these predisposing factors never succeeded in effecting a cure by themselves. This was accomplished only when the hernia was retained inside

the abdominal cavity completely and constantly, by means of a truss, which must be worn for years. It must not be removed except when the baby is sleeping quietly. Trusses are uncomfortable in the beginning, and give rise to cutaneous irritation, particularly under the influence of urine. So much the more is it necessary to keep the truss clean, and always to select one which fits exactly without exerting too much pressure.

Hernia is easily reduced into the abdominal cavity. But there are on record quite a number of cases in which incarceration and strangulation required operative interference. The operation should not be delayed after reduction proved impossible, even under the influence of an anæsthetic. An instance of a successful operation on a case of strangulated *femoral* hernia, which occurred in a girl of eleven years, has been reported by St. Germain. Rees succeeded in reducing an inguinal hernia by aspirating from the intestine a quantity of turbid liquid. An exceptional case of the kind, however, must not be recommended for general adoption.

Catarrh of the rectum behaves very often like a merely local disease. Indeed, it may occur as the result of a local irritation of the anus (scratching, sitting on muddy stools) and oxyuris, foreign bodies or hardened feces. In all these cases the treatment has to be directed to the cause, which must be removed. Warm injections of water, flaxseed tea, starch decoction (with a little opium in tenesmus) are ample. Real proctitis, leading to ulceration (other than dysenteric) or fibrous hyperplasia, will be but infrequent results. But it may occur, the infiltration may become copious and lead to an invasion of the surrounding cellular tissue. This periproctitis gives rise to abscesses, and often to fistula, either external or internal, complete or incomplete. These, as well as the periproctitic abscesses, due to pyæmia, sepsis, or the severe form of typhoid fever, require early incision.

Prolapse of the anus and rectum is the consequence of catarrhal and inflammatory irritation and softening. It will follow chronic catarrh and dysentery. It is produced by debility of the sphincter, which is often congenital, sometimes the result of neighboring diseases; also due to drastic purgatives,

or constipation with the incidental straining. Such straining, resulting in prolapsus, is also produced by the presence of polypus or worms in the rectum, by stone and catarrh of the bladder, and phimosis. A predisposition arises from the peculiar shape of the rectum in the young. It is straighter, inasmuch as the sacrum is not scooped out, as it is in the adult.

The temporary reduction of the prolapse is readily accomplished, particularly in such cases as those in which the sphincter is feeble, but the intestine will come down again. Attention must be paid to defecation. The children must not be allowed to strain. Thus the chamber must be placed in such a position, and raised to such an extent, that the feet cannot touch the floor, or the child must not be permitted to sit up during defecation.

Hippocrates makes the following remark on this subject: "In children suffering from stone, and protracted genuine dysentery, the rectum is apt to protrude. It should be pressed in with a soft sponge, and touched with a snail. Then the patient should have his hands tied, and be suspended a short time, and thus the rectum will slip in. If it comes down again, a band should be placed around the loins; a bandage must be attached to this, and the rectum, after being moistened with a decoction of lotos, be replaced with a soft sponge. Also, the intestine must be washed with this decoction and the bandage carried up between the legs to the umbilicus. During defecation the baby must sit with extended legs upon the feet of the mother, its body leaning against her knees."

Many appliances have been devised to retain the rectum inside. Adhesive plaster has been used as best it could, and a number of instruments have been invented for the purpose of retaining the rectum in position, while leaving an opening for the passage of the fæces. They have been made of hard rubber, lead, and other materials.

Others have used a tampon, and some a compress to hold the nates together; but a tampon will certainly dilate the paralyzed sphincter more than it was before.

Curling confines his efforts to compressing the nates.

The main attention must be given to the treatment of con-

stipation or diarrhœa, of the local catarrh, the rectal worms, the presence of polypi, the presence of stone in the bladder and phimosis, and all the causes of straining and prolapse which have been enumerated above.

But there are direct indications which can be fulfilled. Astringents have been used locally in the form of injections; principally alum and tannin, in solutions of one or two per cent. Ice has been applied locally, and injections of from half an ounce to an ounce of ice-water can be used with advantage three or four times a day.

One enema must be given daily for the purpose of emptying the colon and avoiding the possible straining.

In most cases there is considerable swelling, sometimes real hypertrophy of the mucous membrane and of all the tissues. Swelling and hypertrophy must be reduced. A part of the hypertrophied tissues has been excised. Caustics have been used, for instance nitrate of silver. It must be carefully neutralized immediately after the application by chloride of sodium in solution. Concentrated nitric acid has been employed for the purpose of destroying some of the superfluous tissue. The best remedy, however, for this purpose is the actual cautery. It should be applied either in long welts or stripes, or at half a dozen or a dozen points. It matters not whether the galvano-cautery, or Paquelin's thermo-cautery, or the common actual cautery is selected.

For the purpose of strengthening the sphincter, I have used frequently, for dozens of years, an ointment consisting of extract of nux vomica, one part, in ten or fifteen parts of fat, to be applied to the lower part of the rectum from three to five times a day, or every time the bowel protrudes. The internal administration of strychnia is of very little avail; but that of ergot is serviceable. The subcutaneous injection of strychnia (sulphate one-sixtieth to one-thirtieth grain dissolved in water, once daily) in the neighborhood of the sphincter will be beneficial, particularly when supported by the action of the interrupted electric current, which may be applied for a few minutes once or twice every day.

Fissure of the anus is by no means rare in infants and children, particularly in the latter. It gives rise to symptoms

similar to those encountered in adults: severe pain during defecation, tenesmus, dysuria. Many cases of alleged flatulency and colic, and excruciating screaming spells, are due to fissure. The more severe form follows a direct injury by foreign bodies, hard fæces, etc.; a mild form is due to slight erosions and ulcerations, the rhagades of congenital or acquired syphilis, or the sores made by erythema, eczema, or herpes, and by vulvo-vaginitis. The mildest form is that which is found on a very loose and dilatable anus. This yields readily to a mild treatment of the sore with a solution of nitrate of silver. Cases depending on syphilis require both a general and local treatment, vaginal catarrh must be stopped, and eczema healed.

The treatment of the severe form has consisted in the relief of occasional diarrhoea, and that of the more frequent constipation by enemata and mild purgatives, in the application of astringents, such as lead, copper, zinc, or alum; or of caustics, such as nitrate of silver (Esmarch) or of nitric acid. This treatment is painful and tedious. Boyer advised incision through the whole of the sphincters. The open wound may bleed and give rise to ulceration, or sepsis. The proper treatment consists in dilatation of the sphincters. Josseline directs it to be gradual, thereby protracting uncertainty and pain. The best and speediest method, however, is forcible and instantaneous dilatation, without anæsthesia. The operation takes so little time that it is hardly required except in very puny or convulsive infants or children. The introduction of two fingers of the same hand is rarely sufficient; three or four do better. The easiest way is to use the two index fingers; a sufficient dilatation is recognized by the distinct sensation that the muscular fibres have given way. The external wound is trifling, and but superficial.

In the rare cases of fissure and polypus combined the treatment has to be directed to both.

Polypi of the rectum are tumors of the size of a pea up to that of a cherry or hazel-nut, or more. They are single or numerous, quite soft, or more frequently of greater consistency, composed mostly of cells or cellular tissue, quite vascular, and contain often a harder adenomatous nucleus, and a Lieberkuhn gland imbedded in them. They are either pedunculated or

sessile, on a broad base. They are sometimes found between the two sphincters, mostly above and near the inner sphincter, not infrequently, however, all over the middle portion of the rectum, and sometimes quite near the so-called third sphincter.

Among the symptoms we meet with abnormal defecation (constipation, diarrhœa, or both in alternation), sometimes enteralgia or tenesmus, and frequently a discharge of mucus or blood. Tenesmus is found about polypi when seated near the internal sphincter, or between the two sphincters. Blood is seldom mixed with mucus, mostly quite clear, from half a teaspoonful to a teaspoonful, sometimes more, so that the constant repetition of these small hemorrhages is sufficient to result in anæmia. The tumor is often pushed into or through the anus during the evacuation of the bowels.

The treatment consists in the removal of the tumor by means of the snare, the galvano-caustic snare, by pincers, or by the fingers, or by ligature. The latter is easy of application in all cases in which every movement of the bowels succeeds in rolling out the growth like a foreign body. In these many excursions a polypus with a thin pedicle is often removed spontaneously. When that occurs there is hardly a show of blood. Indeed, there is seldom much bleeding after removal. It is true that some writers report the occurrence of hemorrhages, but in infants and children, with whom varicosities of the blood-vessels are exceedingly rare, I have never seen a hemorrhage of any account after breaking the pedicle with my finger in the rectum. The latter is very accessible indeed to an index finger of moderate size.

Sessile polypi do not give rise to urgent symptoms, and are not easy to find, sometimes. The astringent injections which are to remove them must be mild. Solutions of one per cent. of alum, injected several times daily, will be found sufficient, or a two-per-cent. ointment, or suppository.

(To be continued.)

DISEASES OF THE MOUTH (NON-SURGICAL).

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(Continued from September Number.)

VIII.—DENTITION.

I HAVE collected a list of modern authors in tabular form in order to show how widely they differ on the subject of normal teething, and to bring out another point which will be discussed hereafter. The list is far from complete or exhaustive, but will, I think, illustrate what is to be shown. The authors who claim that normal teething goes on in the first manner described above are as follows :

Two lower Central Incisors.	Two upper Central Incisors.	Two lower Lateral Incisors.	Two upper Lateral Incisors.	Four First Molars.	Four Canines.	Four Second Molars.	
6-7 months.	4-6 weeks. +	4-6 weeks. +	4-6 weeks. +			End of 2d year.	Hyrtl, 1873.
7 months.	2 weeks. +	4-6 weeks. +	4-6 weeks. +	12-14 months.	16-20 months.	20-30 months.	Tanner and Meadows, 1871.
7-8 months.	2 weeks. +	4-6 weeks. +	4-6 weeks. +	12-14 months.	3-4 months. +	24-30 months.	Day, 1881.
3-10 months.	9-16 months.	13-17 months.	13-17 months.	16-21 months.	16-25 months.	23-36 months.	Baginsky, 1887.
6-12 months.		10 months.	11 months.	12-16 months.	17-20 months.	20-24 months.	Fleischmann, 1877.
7 months.	6 weeks-2 months. +	In a short time. +	In a short time. +	3-4 months. +	3-4 months. +	24-30 months.	West, 1874.
7-9 months.				12 months.	16-20 months.	Second year.	Eustace Smith, 1884.
6-7 months.	At end of 12 months.	At end of 12 months.	At end of 12 months.	12-16 months.	16-24 months.	24-30 months.	J. Lewis Smith, 1881.
7-9 months.	Several weeks. +		End of first year.	15-18 months.	18-20 months.	20-24 months.	Henoch.

Those that claim that normal teething goes on in the second manner are as follows :

Two lower Lateral Incisors.	Six Incisors.	Four First Molars.	Canines.	Four Second Molars.	
6-9 months.	2 weeks-3 months. +	First half 2d year.	Second half 2d year.	Third year.	Schnitzer and Wolf, 1849.
5-8 months. (4 central.)	7-10 months (4 lateral.)	12-16 months.	14-20 months.	18-36 months.	Semple, 1884.
6-7 months.	7-9 months.		Beginning of 2d year.	End of Second year.	Henke, 1830.
To which may be added Meissner (1844), who makes teething begin at seven months and end with the second year of life, and Wendt (1835), beginning with the 20th-28th week after birth and ending the middle of the second year.					

Authors who believe the third method to be the rule are as follows :

Two lower Central Incisors.	Four Upper Incisors.	Four First Molars and two lower Lateral Incisors.	Four Canines.	Four Second Molars.	
4-7 months.	8-10 months.	12-14 months.	18-20 months.	28-34 months.	Gerhardt, 1874.
4-7 months.	8-10 months.	12-15 months.	18-24 months.	20-30 months.	Starr, 1886.
5-7 months.	8-10 months.	12-15 months.	18-24 months.	30-36 months.	Hüttenbrenner, 1888.
4-7 months.	8-10 months.	12-15 months.	18-24 months.	20-30 months.	Vogel, 1874.
7-9 months.	8-10 months.	12-15 months.	18-20 months.	20-30 months.	Jacobi, 1887.
6-8 months.	8-10 months.	12-14 months.	16-20 months.	20-36 months.	Dorning, 1889.
2-15 months.	11-12 months.	17-18 months.	2 years.	30 months.	Barthez and Rilliet, 1861.

As has been seen by these tables, a wide difference exists, not only as to the order of dentition, but also as to the times of the eruption of the different groups. The earliest time given for the appearance of the first tooth is two months, the latest, fifteen months, although the same authors (Barthez and Rilliet) state that normal teething may begin at any time during the first two years of life. The termination of teeth-

ing is put down, at its earliest, at eighteen months, and at its latest at thirty-six months; concerning the latter dates there seems to be more uniformity of opinion than concerning the beginning of dentition.

The questions to be discussed are: Who is right among these observers, and how are these observations, apparently irreconcilable, to be explained?

A great many authors have put down the two limits instead of the average time of their observations, so that we can readily understand the statements of Barthez and Rilliet. Again, the time of eruption of the first teeth depends entirely upon certain conditions of the child and its surroundings. Nationality, therefore heredity, plays a most important rôle: French children teethe early; English, Russian, German, and Italian children, one to two months later on an average, and Hungarian children still later. In this country, on account of the presence of so many nationalities and their mixture, we naturally find that the average time of teething depends largely upon the material taken for the calculation. It is my own impression that the average child has its first two teeth with the completion of the seventh month, and this seems to accord with the statements of most American authors (Jacobi, Dorning, J. Lewis Smith), Starr alone having retained the four to seven months for the first two teeth, as put down by Vogel and Gerhardt, which must surely represent exceptions and not the rule.

It is stated that climate has an effect upon the time of teething (Fleischmann), and this can be accepted, as the explanation would be found in the effect of climate upon the general constitution. The latter, after all, is the predominating cause for the early or late eruption of teeth, everything else being equal. This has been proven very frequently, although, possibly, in a given individual case it may not be true. The development of the teeth goes on equally with the general development; a child, well developed for its age, will usually have its teeth early and regularly, and the converse of this holds true.

There are certain diseases which retard the eruption of teeth; but beyond this, there are children that teethe late with-

out any appreciable cause. It is going too far to state, as Rehn does, that every case of delayed dentition is due to rickets. The observation is frequently made, and I am prepared to verify it fully, that there are certain families whose children teethe late, and yet these children are in good condition in every respect. The time of eruption depends for its physical basis upon: first, the distance that the tooth has to go through from the dental sac to the mouth; secondly, the time when the calcification of the fang begins; and, thirdly, the condition of the organs from which the tooth develops. If the distance be great, it can be overbalanced by an early and great deposit of calcareous matter in the tooth; a tooth which is quite superficial might be long in coming through if the deposit is not sufficiently early or great. Lack of development in the rudimentary organs could be compensated for, partly, by an early and great calcification; but it is manifest that this could only be to a certain degree, and in some instances no compensation could take place in any manner. Now, the deposit of calcareous matter is a process depending mainly upon a proper supply of raw material in proper form, and this, again, is due principally to general causes, and not to those acting in a purely local way. There are those effects upon the embryonic structures which are never overcome (syphilis); again, there are those which leave structural changes (diseases of the fœtus); and, finally, those that produce a great retardation of eruption (rickets, fevers during infancy, etc.).

As far as the order of eruption is concerned, it is not difficult to reconcile the various methods that have been described. The fact remains that, as in the case of normal labor, we must make a compromise in order to state which is the normal method of teething. This can be done only, as it has been done in obstetrics, by a carefully-conducted statistical research, which shall include a great number of cases. In this way we would be able to establish one way of normal teething instead of the three put down by authors. As it is, we must admit that normal dentition may go on in any one of the three ways, and that the differing views mean only that one author has observed his way most frequently. There are several lines upon which

all the writers meet: first, that the two lower central incisors appear first; secondly, that these are followed by the upper incisors; and, lastly, that the first molars appear before the canines. It certainly seems strange that we still find authors, including one on dentistry, who find the canine teeth appearing before the molars, and it is very difficult to explain these statements, if we consider them based upon observation on the part of the authors themselves.

The reason why certain teeth appear before others depends upon the explanation given before. The more perfect the embryonic structures, the nearer the surface of the mouth, and the smaller the tooth, the sooner will it come to the surface. These are the factors that cause the incisors to appear first, to be followed by the molars, and then by the canines. In the latter, it is the calcification of the fang that causes its late appearance; it is not due to some far-fetched metaphysical reason, as claimed by some authors, but simply a question of lime-salts.

We must look to the same causes for premature dentition as we do for normal dentition. It is a well-recognized fact that, occasionally, children are born with one or more teeth, and the omens that have been attached to this, or to the appearance of teeth before the fifth or sixth month of life, are numerous. Some claim that it is a favorable sign of longevity, strength, good teeth, etc.; others claim the opposite. These cases occur in the experience of nearly every practitioner, and their importance has been magnified, not so much by physicians as by historians, especially by those who have studied their history from the stand-point of predestination. Premature teeth can be divided into three classes, each of which is due to some alteration in the action of one of the fundamental causes for the eruption of teeth. Changes in the embryonic structures produce teeth without fangs that hang more or less loosely, and are attached by a strip of mucous membrane only. An unnaturally small amount of covering to a tooth will cause it to appear long before its time, and, finally, too great or too early deposit of calcareous material will produce the same result. It occurs, sometimes, that more than twenty primitive teeth are formed, and then one or more may be found prematurely

in the mouth. Primitive teeth, produced as the result of the first two causes, are, as far as we know, of no prognostic significance. Those due to premature calcification are said to denote premature ossification of the bones of the head. "As a general rule, however, premature appearance of the teeth is connected with premature ossification of the bony system in general, and of the fontanels and sutures of the cranium in particular. When this is the case, the upper incisors, as a rule, appear first, undoubtedly in connection with the fact of the premature ossification of the upper part of the cranium. This is a serious occurrence. When premature ossification is congenital, it makes parturition difficult and renders the child idiotic or epileptic." (Jacobi, "The Intestinal Diseases of Infancy and Childhood," pp. 102-103, 1887.) While all this may occur, and undoubtedly has occurred, yet, according to my own observation, it must be the exception. If any change about the head of a child with premature teeth is to be noticed, it is just as apt to be in the direction of hydrocephalus as the opposite; therefore large fontanels and diastatic sutures. It is now over fifteen years since my respected teacher, Jacobi, first called my attention to this combination of irregular teething and idiocy. Since that time I have examined into the history of every child whose two upper incisors came through first, and also into the relation of the teeth in idiots with premature synostosis. The latter instances are comparatively rare, but in not a single instance could the mother be positive that the upper teeth appeared first. In several large-headed idiots, or rather, idiots with widely-open fontanels and diastatic sutures, I have been able to elicit the fact that the upper teeth had appeared first, but not in a sufficient number of cases to establish any law. It has always seemed to me to be purely a coincidence. As I have not kept record of these cases,—it being almost impossible to do so,—my statements, as opposed to those of so reliable an observer as Jacobi, must go on record for what they are worth, to be verified or overthrown by future records.

The question of what is to be done with these premature teeth is one that is deserving of close attention. It will not do to put down the absolute rule that all premature teeth must

be pulled. There are positive indications when one of these teeth should be extracted. When the tooth dangles in the mouth attached only by mucous membrane, there can be no hesitation about severing its connection and getting rid of a foreign body that is absolutely useless. When these teeth are tightly set in the mouth, it always becomes a question what to do with them. The rule can be made that they are to be left alone unless some special indication exists for their extraction. I cannot agree with Fleischmann when he says that "the supposition that children who have teeth can hurt the nipples of their mothers can hardly be taken seriously" (*loc. cit.*, p. 78). There is no doubt that children with teeth do hurt the nipples in more than one way, and that they do not cover their teeth with the lips, as Fleischmann believes. It is true that, in nursing, the two lower teeth are covered by the tongue, but as soon as the upper incisors appear the baby begins to bite at the nipple, and, with women whose nipples are not perfectly normal or thoroughly protected, it is only necessary to see where the fissures are formed in order to convince oneself how these cracks were produced. But, in addition to this, these premature teeth are sometimes situated in such locations as to render all attempts at nursing painful and occasionally futile. When it comes to a question, then, of extracting a tooth or jeopardizing the life of an infant, or even its thriving, the way is perfectly clear, and there can be no possible difference of opinion as to the course to be pursued. The following two reasons are the principal ones for saving these teeth: first, we are never perfectly sure that we are not producing a loss which will not be repaired until the seventh or eighth year of life. The premature tooth that has been extracted may be the only temporary incisor that the child will have, and no tooth will be formed until the permanent incisor makes its appearance; secondly, children with premature teeth may be puny and delicate, perhaps syphilitic; in such children, hemorrhages follow the slightest disturbance of continuity of tissue, and several cases are on record in which children have lost their lives by the extraction of these premature teeth. Magitot, who lost a child after extracting two premature incisor teeth (*Gaz. des Hôpitaux*, 1876), puts down the

rule never to extract these teeth, as the result of his unpleasant experience.

Rickets is the most common cause of delayed dentition. But, as has been pointed out before, not every child that gets its teeth late has rickets. The effects of rachitis upon the teeth are many or none at all, depending upon the amount of rachitic changes that takes place in the bones of the jaw. If, as occurs not infrequently, the bones of the head are not at all attacked by the rachitic process, we can certainly not expect any lesions about the teeth. In such cases, rachitis may develop after the time when the first six or even first twelve teeth have made their appearance, and then there will be, practically, no delayed dentition. An attack of rickets coming on at so late a time may delay the eruption of the following teeth, but, manifestly, this is accomplished by constitutional derangement only, and not by any local effect. But rickets is by no means the only cause that produces late teething. Any disease producing a disturbance followed by diminution of nutritive supply to the teeth will result in a late eruption of the teeth, provided all the other factors for dentition are present in normal quantity. As such we must reckon all disturbances accompanied by long-continued fevers, all long-continued diarrhoeas, all so-called cachexias. It will frequently be seen that one or more teeth come through during an attack of scarlatina, typhoid fever, etc., and this does not militate against the view just expressed. If this patient be kept under observation for some time, the next group of teeth will be found late in their appearance, and, possibly, deformed.

A more common cause for this late eruption of teeth is to be found in heredity. In another place I have recorded three generations of people; the first of these was decidedly rachitic; square head, bow-legs, etc.; the second, with the same bony malformations to a less degree; and the third, with the characteristic square head without ever having had any symptoms of rachitis. This is, what seemed to me, a well-marked example of the law of heredity. In the same way we can imagine late teething set up in a family, by some affection, perhaps, that has acted through several generations, and resulting, ultimately, in a hereditary tendency. Early or late

teeth are just as distinctive of families as are good or bad ones.

Defective food-supply (*i.e.*, in calcareous material) is one of the conditions accused as the first cause of the establishment of a hereditary tendency. Thus, a deficiency of lime has been held to result in late or bad teeth. This is perfectly correct, theoretically ; but, as a result of years of experimenting upon the human being, I have come to the conclusion that we are not in a position to directly affect the teeth by any remedy we may give. Any one of the so-called proximate principles of the tooth may be given indefinitely to a child, and the effect upon the tooth is *nil*. We may (and it has been done by many) produce conditions in the lower animals which will affect the teeth most decidedly, but such artificial conditions can be conceived of as in relation to the human being only in very exceptional cases. It would be difficult to conceive of a condition, for instance, in which all earthy material is absent from the food, unless we would take absolute starvation into consideration. It is highly probable that a deficiency of earthy salts in the food extended over a great period of time does affect the teeth, but hardly in the direction that is under discussion at present. There can be no doubt that children are made rachitic by deficient salt-supply, but this deficiency rarely manifests itself in time to affect the first teeth ; in other words, when the food is so bad as to affect the teeth to the extent of preventing the small quantity of calcareous matter needed to cause them to make their appearance in the mouth, the child will not survive. The effects of drinking-water can be taken into consideration only as regards the permanent teeth, since children at the breast do not receive enough water to produce any changes in the teeth. As far as the permanent teeth are concerned, no conclusive relation has, as yet, been established.

There is a good rule for the time of the eruption of the permanent teeth : they appear in the same order as the milk-teeth and at a number of years corresponding to the months of the milk-teeth, with the exception of four teeth,—the first molars. The latter teeth appear about the sixth year ; they are the first to come through after the second molars in the

temporary set, and are found directly behind them. Changes take place in the temporary teeth while this is going on; the bony septa between them and the permanent teeth are being absorbed, their blood-supply is being cut off because of the obstruction of their arteries, and gradually, as the result of absorption, they are ready to drop out. Momentous alterations in the whole economy are ascribed to these changes by some authors, for which there is even less reason than for those attributed to the temporary teeth, and which must be looked upon in all cases as cerebral—either upon the part of the physician or upon that of the patient.

As there are thirty-two teeth in the permanent set, the above rule is one that can be accepted only in the rough, but, nevertheless, is one that facilitates memory very much. The second teeth to appear are the canines, from the seventh to the eighth year. These are followed by the bicuspid or premolars, about the tenth year; then the canines, about the twelfth year; and finally the molars, from the twelfth to the twenty-fifth year.

A table would be constructed as follows:

First Molars.	Incisors.	Bicuspid.	Canines.	Second Molars.	Third Molars.
6 years.	7-8 years.	9-10 years.	12-14 years.	12-15 years.	17-25 years.

(To be continued.)

PERITYPHLITIS IN CHILDREN.

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C. H., male, eight years old. Three days before I saw him he was seized with vomiting and diarrhœa, attributed to eating. Castor oil had been administered without relief, though bowels were freely moved. At my first visit the abdomen generally was tender, though the pain was more intense in the right iliac fossa. The abdominal muscles on both sides

were rigid and legs were drawn up. Some difficulty in urinating. The pain was readily controlled by small doses of morphia. No tumor or dulness in the ileo-cæcal region. Under the use of small doses of morphia and bismuth, the general symptoms improved; the vomiting ceased, pains grew less, but the tympanites and abdominal tension became more marked. On the sixth day of the illness a rectal examination demonstrated a fulness and some bulging to the right and somewhat posteriorly in the rectum. It was then determined to explore the right iliac fossa, and accordingly, a small aspirating needle was introduced about one-half inch above the anterior superior iliac spine, directed downward, inward, and backward, pus being readily detected. No tumor could be detected by external palpation on account of the tympanites and rigid condition of the abdomen. Hepatic dulness preserved. Temperature, $101\frac{1}{2}^{\circ}$; respiration, 20; pulse, 80.

Diagnosis.—Perityphlitic abscess with acute general peritonitis. The peritoneal inflammation was not regarded as septic in character, but was thought to be due to an extension of the inflammation to the general peritoneum. An incision was now made a little above and along the outer half of Poupart's ligament, the tissue divided layer by layer, and the abscess opened, pus with a fæcal odor escaping. The finger was now passed in and the cavity explored; no fæcal concretion or sloughing appendix was felt. Two drainage-tubes were then inserted, one passed upward and backward, the other downward to drain the pouch felt through the rectum. The cavity was then washed out, and a bichloride gauze and borated cotton dressing applied. On the third day fæces were discovered on the dressing; four days later two small fæcal concretions were washed out in irrigating the wound. The fæcal discharge ceased in a few days; the drainage-tubes were then removed, and the wound healed in about two weeks, followed by recovery of patient.

F. D., male, ten years old, had not been in good health for some time past. During the four days prior to the time he came under my care he had been compelled to remain in bed because of the intense abdominal pains, particularly in the region of the cæcum; had been feverish during this time, vomiting con-

tinually, very much prostrated, considerable diarrhœa. At my first examination I found him lying on his back with his right thigh flexed, with rigidity of the abdominal walls, particularly on the right side. Palpation, cautiously and gently performed, demonstrated the existence of a tumor in the right iliac fossa. Urination frequent and difficult. Pulse feeble, tongue dry and brown; patient in a typhoid state.

Rectal examination revealed a fulness to the right and somewhat posteriorly. A large hypodermic needle introduced into the most prominent portion of the swelling revealed the presence of stinking pus. Diagnosis, perityphlitic abscess.

Two hours later he was chloroformed, and, with the assistance of Drs. Denhard and Horn, the abscess was opened; the dissection being made layer by layer, and about six fluidounces of fetid pus escaped. The cavity was then carefully explored with the finger, but no foreign body or concretion could be felt. Two pouches were detected, one running up and backward, the other downward towards the rectum. Two drainage-tubes were then introduced, the larger—five inches in length—reached to the bottom of the pouch along the rectum; the second drained the upper portion of the wound. Irrigation and antiseptic dressing applied. A small hypodermic of morphia then injected. The pain ceased, the vomiting and the difficulty in urination disappeared at once. Bowels moved spontaneously the following day. On the fourth day a ragged slough, about four inches long, was washed out in irrigating the wound. The tubes were gradually shortened and then dispensed with, a small sinus being left. On the twenty-third day a large fæcal concretion was discovered on the dressing, after the escape of which the sinus closed in a few days. Perfect recovery followed.

In addition to these two in which an operation was required, I have observed at least a dozen cases in children in which resolution occurred. In three of these recurrences took place. In one case three times within a year. I have also met with four cases of perforative peritonitis, all fatal.

These cases will serve to introduce the subject of perityphlitis in children.

Typhlitis, inflammation of the walls of the cæcum; peri-

typhlitis, inflammation of the peritoneum covering the cæcum ; paratyphlitis, inflammation of the connective tissue behind the cæcum ; and appendicitis, inflammation of the appendix, are various terms employed to designate the morbid train of symptoms, characterized by pain and tenderness, in the right iliac fossa, the presence of a tumor in this situation which may resolve or go on to the formation of pus with local or perhaps general peritonitis, accompanied by vomiting, febrile disturbances, constipation or diarrhœa, and dorsal decubitus, with thighs flexed. As yet we are not able to differentiate clinically between the affections of the cæcum and those of the appendix ; the term perityphlitis, therefore, is employed by many authorities in a wider sense, to cover the complex inflammatory processes in this region, rather than to limit the expression to its more correct anatomical application. The affection is of frequent occurrence in the young, and shows special predilections for the male sex. This is true in infancy and early youth, as well as in adolescence. Of 21 cases collected by Gerhardt, 13 belonged to the male sex. Meigs and Pepper observed 13 cases which resolved, 8 being male and 5 female ; and of 43 cases collected by them, in which recovery took place, 27 occurred in males. Of 6 cases of perforation of the appendix, under fifteen years of age, 4 were males, 1 female, 1 sex not given.

Matterstock found that nine per cent. of the cases collected by him occurred below the age of ten years, and thirty per cent. between the ages of ten and twenty years. Labardie-Lagrange met with 13 cases between the ages of ten and fifteen out of a total of 122. Demme and Bouchut saw 72 cases in 90,000 children. Volz found that in 35 cases in which the autopsy confirmed the diagnosis, 11 were in children. Lewis reports 47 cases, 6 of which were in children under ten years.

The anatomical peculiarities of the cæcum and appendix, the greater irritability and proneness to inflammation of the intestinal tract in the young, constipation, cold, and exposure, indigestible food, blows, and the strumous diathesis have been regarded as causes of the disorder. The appendix is relatively larger and longer in the newly-born child than in the adult. The colon of the newly-born is only four times, whereas that of the adult is eight times, as wide as the process. This certainly

yields predisposition to the entrance of foreign bodies into the process in children. Hecker and Bute found a concretion of meconium in a newly-born child. Betz reports a perforation of the appendix in a child seven months old, and Faber one in a girl three and a half years of age. Cases in the very young are rare, for some predisposing cause is necessary. A previous typhlitis or peritonitis—even diarrhœa, constipation, dysentery, typhoid fever, tuberculosis, or any lesion causing a moderate local peritonitis with resulting adhesions of the appendix—may cause greater patency with diminished elasticity in the vermiform process, and thereby favor the formation of concretions or the entrance of foreign bodies. About three-quarters of the recorded cases of perforation of the appendix are due to concretions, infrequently to foreign bodies.

In 49 cases in children, fæcal concretions were found in 27 instances, foreign bodies in 3, and nothing abnormal in the remaining. In the two cases presented this evening, fæcal concretions escaped with the discharge from the wound; two smaller ones in one case and a large one in the other.

Abnormal conditions of the mucous membranes undoubtedly precede the formation and lodgement of the masses, which may remain inert or, through the agency of germs or virus of disease ingested in the food or drink, act as irritants, and cause local gangrene or peritonitis, and thereby set up the train of symptoms now under discussion.

Inflammatory conditions, except as the result of foreign bodies or fæcal impactions, are not frequently met with in the cæcum. Primary cæcal perforations are exceedingly rare, though Henoch reports a case. In the greater number of instances the appendix is the seat of the trouble, and a foreign body, or more frequently a fæcal concretion, will be found in the appendix, in an abscess cavity or free in the peritoneum. The appendix itself may be inflamed, filled with mucus or pus, may be ulcerated, perforated in one or more places, gangrenous or entirely destroyed. The walls may give way as the result of distention. Dr. Wilks saw a case in which the appendix was dilated to the size of the ileum, and contained three to four ounces of white, odorless mucus. Old and recent adhesions are frequent. Abscesses are encountered in the fossa,

behind the cæcum, in the pelvis, or in the right lumbar region, depending upon the anatomical variations in the situation of the appendix. The existing peritoneal inflammation may be limited to the neighborhood of the affected organ, may be general, or may be suppurative in character. .

The most prominent symptoms are pain and tenderness in the right iliac fossa, dorsal decubitus with knees drawn up, rigidity of the abdominal walls, particularly of the right side, and an irregular tumor, more or less distinct, in the ileo-cæcal region. Febrile movements, irregular in character, also exist. To this series we may add diarrhœa or constipation, nausea or vomiting, colicky pains irregularly intermitting and of greater or less severity. More or less prostration and a typhoid state may be present. More or less difficulty in urinating may also exist.

The disease may begin suddenly with very severe pains, more or less shock, the iliac pain being obscured by the general peritonitis, and the case terminates fatally in a number of hours or runs along for one to six days. Or the pains may be intense, some shock exist, and general tenderness be found over the entire abdomen ; more, however, in the right iliac fossa. After the lapse of a few days or a week a tumor can be detected and an abscess results. In a third class of cases the pain may be moderate, more or less vomiting, and some tympanites. The swelling soon shows itself, and pus is found. Finally, we have another class in which—though the initial symptoms may have been severe, and a tumor forms—resolution will take place. Relapses and recurrences are frequently observed among the latter.

In children there is frequently a prodromal stage, lasting for weeks or months before a definite diagnosis can be arrived at. We find anorexia and vomiting, constipation, and at times diarrhœa with colicky pains about the ileo-cæcal region. In some cases the pains may be felt in the epigastric region or in the left ileum, as was the case in those instances mentioned by Bouchut, Herzfelder, and Traube. In several cases Jacobi found the pains most marked along the transverse colon. Some difficulty may be met with in walking or standing, the patient favoring the right side. Examining, we find pain,

with more or less rigidity of the right side of abdomen, some fulness or a distinct tumor. There may be tingling or weakness in the right leg, painful sensations and even loss of power. The tumor may not be perceptible, and we may only be able to appreciate increased resistance to pressure and exquisite tenderness along the cæcum.

In practice, according to Dr. Bull, two classes of cases are met with :

1. Catarrhal perityphlitis, which tended to resolve; it occurs in a large number of cases, and may go on to suppuration.

2. Suppurative perityphlitis, when suppuration, perforation, or gangrene occurred with (a) spreading peritonitis, (b) limiting or circumscribed peritonitis or "intra-peritoneal abscess," and (c) cellulitis, iliac or lumbar, or both, or "extra-peritoneal abscess," and finally, (d) portal phlebitis, with or without hepatic abscess. The extra-peritoneal abscess (c) is secondary in most cases; but where the appendix is extra-peritoneal, or where it or the cæcum had been excluded from the peritoneal cavity by old adhesions, it might be primary.

As has been well said, the life of the patient is in the hands of the general practitioner, as the case is first seen by him. The question of diagnosis is of the greatest importance, and the early recognition of the case contributes materially to the welfare of the patient. In a case which I saw with Dr. Newfield, only the most careful examination enabled us to exclude hip-joint disease. Dr. Gibney has observed a number of cases in children, from eight to ten years of age, who presented the characteristic deformity of hip-joint troubles. The peripheral pains along the right lower extremity may be misleading. The history of the cases and the presence of rigidity and tumefaction in the ileo-cæcal region will exclude typhoid fever. In intussusception we have bloody discharges from the rectum with severe tenesmus. The characteristic rectal tumor will also clear up the case. Impaction of faeces is differentiated by the prior history of constipation, by sausage-shaped tumor along the ascending colon, by the slight tenderness and the peculiar feel.

In a girl of eleven years of age, an ovaritis of the right side, due to gonorrhœal infection, presented some of the symp-

toms of perityphlitis; the characteristic vaginal discharge and a vaginal examination excluded any affection of the appendix.

The difficulty of diagnosis at times is well illustrated by the following case:

A girl of seven years of age had had a vaginal discharge for a short time. She was an exceedingly anæmic patient. No history of gonorrhœal infection and no cause for the vaginitis could be made out. The general weakness and some soreness about the lower part of her abdomen made her take to her bed. The same day vomited considerably, a little blood being found in the vomited matter. The abdomen generally not tender, some little soreness over the pubes. Pulse good, no pain, some diarrhœa (though constipation usually existed). No elevation of temperature. The little patient was in good spirits. At my evening visit I found her in a collapse, with severe pains in the right iliac region.

Diagnosis, perforation of appendix. A few hours later Dr. Charles E. Denhard saw her and confirmed the diagnosis. The following day Professor Jacobi was requested to see the patient. In view of the rapid onset with collapse, pains more severe in the right iliac region, and the rapid spread of the inflammation, the diagnosis of general peritonitis, due probably to perforation, was confirmed. The same evening vomiting set in, and soon assumed a greenish character, the tympanites became more marked, and general abdominal tenderness greater. Temperature not over 101° (rectal). Pulse 130, very weak. The following day Professor William T. Bull was called in consultation, with a view to the advisability of performing laparotomy. The diagnosis was confirmed, and, as soon as the consent of the parent could be obtained, a laparotomy was done by Dr. Bull, with, however, but faint hopes of ultimate success, as the heart's action was very weak, pulse about 150. The patient was chloroformed by Dr. Denhard, and at the operation, done by Dr. Bull, considerable sero-purulent fluid was found in the abdominal cavity. The intestines were congested, here and there some lymph was found,—no adhesions between the folds.

The appendix was searched for and found *intact*, no fecal concretion to be felt. The Fallopian tube and fibrinated extrem-

ity on the right side thickened and congested, and it now became evident that the infection had taken place through the genital tract, and had thus given rise to the peritoneal inflammation, simulating so closely a perforation of the appendix that the correct interpretation of the symptoms was only possible after the abdomen had been opened.

The cavity was now washed out with hot water, and the wound closed and dressing applied. A rectal injection of brandy and water was then administered, and the patient put to bed with the head low. The patient rallied, but the vomiting continued, and death took place twenty hours later.

The diagnosis, as a rule, is readily made. The pain and tenderness, together with rigidity of the right side of abdomen and the presence of a tumor, with the digestive disturbances, are sufficiently striking not to be overlooked.

Pepper lays great stress upon the necessity of examining per rectum to determine at an early date the existence of an inflammatory tumor and pus.

Constitutional symptoms do not enable us to make the diagnosis of pus, nor is it advisable to wait for distinct fluctuation. The thickness of the walls of the pus cavity, and the additional covering afforded by the abdominal muscles, make it extremely difficult or impossible to detect fluctuation even in very large abscesses. We are, consequently, forced to resort to the use of the exploring needle in order to arrive at a positive diagnosis. Bull says, needle explorations are a justifiable and desirable method of diagnosis, though attended with some risks. These may be reduced to a minimum if care were taken to reserve the practice for cases in which the symptoms had lasted for several days, and in which a distinct induration tumor could be made out. The needle employed should be inserted obliquely (never perpendicularly), plunging it first near the iliac border and then into the lumbar region, pointing it forward and inward to the location of the cæcum. Gill Wylie, in cases of doubt, where there are chilly sensations or an elevation of temperature, considers it safer to open the abdomen in the median line and explore; his argument being that the sac of the abscess is rounded, and that while one of its aspects was adherent, another might be free. If punctured

through the adherent portion, no harm results. If punctured through its free portion, however, the prick of the needle might allow its contents to escape into the peritoneal cavity and set up a fatal peritonitis. A case in which this happened terminated fatally in twelve hours in Bellevue.

The duration of the disease varies. It may terminate fatally in nine hours or last from one to five days. In children the disease is shorter than at a later period. When the case goes on to resolution, it may last from fourteen to twenty-one days. Early operation and evacuation of the confined inflammatory products or pus materially shorten the duration of the trouble. If the abscess be allowed to burrow or rupture into the bowels or bladder, the resulting evil after-effect may extend over a long period of time. Even in cases which have resolved and are apparently in good health, adhesions resulting from prior inflammation, an encapsulated abscess, or faecal matter temporarily shut off by adhesive inflammation, may light up new troubles through accident or indiscretion on the part of the patient. These relapses and recurrences may greatly prolong the duration.

Prophylactic measures may be resorted to in the young, particularly in those instances in which obscure and colicky pain are experienced at varying intervals. The least tenderness and pain in this region ought to be viewed with suspicion, and absolute rest enforced with a proper diet. In these insidious cases perforation in children has occurred after the use of laxatives or enema.

When an attack subsides, the greatest care should be observed to prevent a relapse. The bowels should be moved by enemata only, no purgatives. The restriction to fluid diet should be kept up for a number of days, nor should the patient be allowed to get up too early.

Recurrences, so frequently encountered, should be prevented by attention to the diet, moderate daily exercise, regular evacuations, and tonic measures to promote regular peristaltic action. Above all, the general health must be improved.

In a boy of five, who was under the care of an irregular practitioner, and who had improved and been frequently allowed to get up, a relapse occurred with fatal results. In another case,

which I saw through the courtesy of Dr. N., the boy improved, and the parent, not understanding the necessity for rest for a few days longer, allowed the patient to get up and eat everything. Result, a relapse confining him to bed for some time longer.

Prognosis.—The disease is accompanied by a large mortality in the young. Grave complications may arise at any time, and the prognosis must be more guarded because of the greater danger of peritonitis. Willard Parker, quoted by Gerhardt, states that perforation and gangrene of the appendix are more frequent in children, abscess formation being more common in adults. The mortality, according to Whittaker, is as high as seventy per cent. in childhood. Matterstock states that forty-four per cent. die within the first seventy-two hours.

Treatment.—Sands, in his emphatic style, asserts that these diseases are surgical cases from their beginning, and that surgeons alone are competent to decide whether operations are expedient, and to perform them when necessary at the right time and in the proper manner.

Fagge, on the other hand, writes, "The course depends very largely upon the treatment which is adopted. . . . When the case is skilfully treated it scarcely terminates otherwise than in recovery. The essential points are that the patient should be kept perfectly at rest, that his diet should be strictly limited to slops, that he should not be allowed to take a single dose of aperient medicine, and that opium should be freely given." These are the extreme views,—the one of the surgeon, the other of the physician. It is certainly true that a number with severe initial symptoms resolve and no further trouble is experienced. In others recurrences are met with at intervals, and subsequent attacks may result in abscess, rupture of prior adhesions, with purulent peritonitis and death.

Before an operation is indicated the principles of treatment, from the stand-point of the physician, are to avoid all sources of irritation from within and from without. The patient should be kept in bed, absolutely at rest, to insure rest to the inflamed parts; he should not be allowed to sit up for any purpose whatever. The flexed thighs may be supported by a pillow under the knees. Liquid diet only should be allowed;

in cases of frequent vomiting rectal feeding or stimulation may be necessary. Opium or hypodermics of morphia in sufficient quantity to relieve pain. The cases have usually been thoroughly purged by the lay attendants without material benefit before the physician is called in, and enemata only should be employed to relieve the constipation after the first few days. No purgatives of any kind *should be* allowed before operation. The lesion is in the appendix, and but rarely in the cæcum; the latter, except in stercoraceous typhlitis, is usually empty. The increased secretion and peristaltic action might precipitate rupture or favor the escape of fæces into the peritoneal cavity. Dr. Habershon, quoted by Fagge, states that he has, at post-mortem examinations, seen castor oil floating on the contents of the abdominal cavity. It seems just as rational to resort to purgatives in injury of the intestines due to traumatism or pistol-shot wounds, etc., as it is to advise them in perforations of the appendix. The risks of early exploration in the hands of a careful antiseptic surgeon are less than the harm done by the *injudicious administration of cathartics* before operation. After the operation has been performed, Tait's plan of administering salines will act beneficially by preventing adhesion, carrying off the morbid products of inflammation, and lessening the engorgement.

Leeches have been applied at the outset of the disease with advantage. Belladonna and mercurial ointments have been advised. Cold applications of various kinds have been used and with benefit, particularly at the outset of the trouble. Hot applications are favored by others. External applications of whatever kind do not seem to make any material difference in the ultimate results. The œdema of the skin produced by the poultice may obscure the local evidence and make the diagnosis more difficult; on the other hand, warmth is more grateful to the patient generally. The feelings of the invalid form a valuable guide here; whatever affords most relief should be used. The meteorism is greatly relieved by the application of hot turpentine stupes. A long rectal tube, cautiously introduced, will at times favor the escape of large quantities of gas. Puncture of the intestines, in view of the paralytic condition of the walls, is attended with great danger.

Should the temperature become normal after a few days, and the local symptoms diminish, resolution is probable. Persistence of fever and swelling, debility, emaciation, sweating, and profound anæmia point to suppuration. Frequently, the temperature will be low even though pus be present ; this should not be forgotten.

Bull, in a recent article read before the Medical Society of London, says, "The general plan of surgical treatment should be as follows : The more rapid the development of the symptoms, the earlier should the surgeon interfere. In the presence of signs of spreading peritonitis, laparotomy should be performed at once, whether they were manifested immediately after the outset of the disease or in the course of milder symptoms. An exploration in cases of doubt would be preferable to waiting for further indications. When peritonitis remains strictly circumscribed, the abscess should be opened by the end of the first week, or as soon as pus could be detected with the needle. But, even if no pus could be found in this way, an incision would be justifiable in the presence of such symptoms as were indicative of prolongation of the suppuration in the cellular tissue."

Bull prefers for laparotomy in these cases a vertical or slightly oblique incision three or four inches in length, leading up from a point a finger's-breadth or an inch above the middle of Poupart's ligament ; and for incision of the abscess a cut starting from the same point, but directed either parallel to the ligament or approaching nearer the vertical, according to the situation of the induration. Gill Wylie prefers for a laparotomy, particularly when extensive peritonitis or adhesions are suspected, an incision in the linea alba, below the umbilicus. Sands advises the vertical incision over the caput coli.

The abscess should be approached by gradual and careful dissection layer by layer. The Hilton-Roser method is unsafe. When the cavity has been reached, thorough digital exploration should be practised, not only to discover the foreign body or concretion, but principally with a view to ascertain the direction and extent of the burrowing, so that the drainage-tubes may be inserted accordingly.

ATROPINE IN ENURESIS.*

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IN December, 1888, Dr. Simon Baruch, of New York, read a paper† before the Pediatric Section of the New York Academy of Medicine, in which he made such positive statements about the value of atropine in enuresis that I at once resolved to try its efficacy upon similar cases in my private practice as well as in the public institutions with which I was connected. While the length of this paper, with the time at my disposal, will not permit me to go into the various causes, and the different modes of treatment, of enuresis, I shall simply content myself at this time in detailing the results obtained in the thirty cases treated in this empirical manner.

. The following formula was used in all the cases,—viz. :

R Atropiæ sulph., gr. i ;
Aq. destillatæ, ʒi. M.

Of which one drop for each year of the age of the child was given at four and seven o'clock in the evening. It was found by actual counting that the ordinary medicine-dropper held eighty drops of this liquid.

CASE I.—Mary B., aged ten, has always had nocturnal enuresis, and for the last two years diurnal also. On January 5, 1889, she took ten drops of the solution at four and seven o'clock in the evening, and did not wet her bed that night, and has not since then had any difficulty in retaining her urine during the night or day.

CASE II.—James E., aged nine, has had nocturnal and diurnal enuresis since an attack of scarlatina when four years

* Read before the Section on Diseases of Children, American Medical Association, Newport, R.I., 1889.

† ARCHIVES OF PEDIATRICS, April, 1889.

of age. He was circumcised when six years of age, but with only temporary benefit. Meatus inflamed. He was given nine drops of the solution twice every evening for a week, with alleviation of the diurnal symptoms, but no apparent effect on the nocturnal symptoms. In the beginning of the second week (January 13, 1889) the doses were doubled,—*i. e.*, eighteen drops were given at the usual hours in the evening, and that night, for the first time in five years, he did not wet the bed and has not done so since, the medicine being discontinued the following day.

CASE III.—John E., aged six, a brother of the preceding patient, has always been troubled with nocturnal enuresis, and has received the usual routine of supposed appropriate remedies without apparent improvement. Prepuce elongated but easily retractable. The above solution was prescribed in six-drop doses twice a day, and after the first dose there was marked improvement, and at the end of the first week he was cured.

CASE IV.—John B., aged eleven, has always had nocturnal but no diurnal enuresis. Prepuce normal; meatus inflamed. After the sixth day's use of the solution his mother brought him to me and said that he was well,—wetting the bed less after the first day, scarcely any after the second, and not at all after the third; and now, after six months' interval, there has been no return of the disagreeable symptoms.

CASE V.—John C., aged six, has always had nocturnal and diurnal enuresis. Prepuce normal; meatus inflamed. After the third day's use of the drops his mother reported that he had not wet the bed at night or his clothes during the day since the first day's doses.

Cases VI. to XXIX. were treated in the orphan asylums of Jersey City, where such cases are kept in separate beds, and are taken up every night about eleven o'clock, urged to urinate, and their clothing, if soiled, is changed. The previous habits, general surroundings, and mode of living before entering the asylum are usually unhealthy, and it is found that cases of nocturnal enuresis are cured by the hygienic and dietetic changes met with in these asylums without medicinal treatment.

CASE VI.—Valentine S., aged twelve, has had nocturnal

enuresis as long as he can remember. Prepuce elongated but easily retractable. The usual doses of the foregoing formula were commenced on January 15, 1889, and continued until February 14, 1889, with impaired vision on January 17 and 18 only, and remittent cessation of the nocturnal symptoms, frequently going three or four nights without disturbance, when he left the asylum on February 14.

CASE VII.—Louise McK., aged six, has been two years in the asylum, during which time she has had nocturnal and diurnal enuresis.

January 14, 1889.—The regular doses at stated intervals were given, with the result that she was cured as far as the diurnal symptoms were concerned, and would frequently go two or three nights without the nocturnal occurrence, and then they would resume for a night, possibly two, and then disappear. On February 14, 1889, the doses were doubled, and she had no return of the symptoms until June 15, 1889, when the nocturnal symptoms again became intermittent, following an attack of measles.

CASE VIII.—Joseph P., aged six, has been three years in the asylum, during which time he has had nocturnal enuresis. Prepuce elongated but easily retractable; meatus normal.

January 15, 1889.—Began the usual doses of formula at the stated intervals, with the result that every once or twice a week did the symptoms return until February 14, 1889, when the doses were doubled and the symptoms have not since returned.

CASE IX.—Gus. M., aged seven, has been one year in the asylum and thinks he has always wet the bed at night. Prepuce elongated, tight, but retractable with the use of a little force; meatus inflamed.

January 15, 1889.—Began the usual doses at stated intervals, but without cessation of the symptoms until February 14, 1889, when the doses were doubled, and since then he has had no recurrence of the symptoms.

CASE X.—James B., aged eight, has been four years in the asylum, during which time (previously he does not remember) he has had nocturnal enuresis. Has a tight phimosis, which is not retractable.

January 15, 1889. Began usual treatment, with cessation of the symptoms for one night in a week until February 14, 1889, when the doses were doubled, and since then there has been a recurrence of the symptoms about two nights in the week.

CASE XI.—William M., aged nine, has been four years in the asylum, during which time he has had nocturnal enuresis. Has hypospadias.

January 15, 1889.—Usual treatment, with intermission of two or three nights in succession, until January 30, 1889, since which time there has been no recurrence.

CASE XII.—James M., aged four (a brother of Case IX.), has been one year in the asylum, during which time he has had nocturnal and diurnal enuresis. Prepuce elongated but retractable; meatus normal.

January 15, 1889.—Usual treatment began, with the result that his diurnal symptoms were cured, and a remission of the nocturnal symptoms,—*i.e.*, he would wet the bed one night and then not for two nights, and again he would wet the bed for two or three nights in succession and then not again for several nights, until February 14, 1889, when the doses were doubled, but since then he wets the bed on the average of about twice a week.

CASE XIII.—Mary R., aged four, has been in the asylum three months. Has always had nocturnal enuresis.

January 15, 1889.—Usual treatment, resulting in a cessation of the symptoms for over one-half of the time, until February 14, 1889, when the doses were doubled, and after the first day there has been no return of the symptoms.

CASE XIV.—Irene D., aged three, has been only three days in the asylum, but the history obtained by the sister in charge is that she has always had nocturnal and diurnal enuresis.

January 15, 1889.—Usual treatment, resulting in an immediate cure of the diurnal symptoms and an intermittent cessation of the nocturnal symptoms, until February 14, 1889, when the doses were doubled, and she has had no return of the symptoms (nocturnal or diurnal) since.

CASE XV.—James A., aged twelve, has been one year

in the asylum, and says he has always had nocturnal enuresis. Prepuce elongated but easily retractable; meatus normal.

January 15, 1889.—Usual treatment, resulting in a complete cessation of the symptoms on January 31, 1889, and they have not since returned.

CASE XVI.—Bernard S., aged fifteen (brother of Case VI.), has always had nocturnal enuresis. He was circumcised in early childhood without permanent results.

January 15, 1889.—Usual treatment (only one dose daily, however, on account of his absence from the asylum during the day), with the result that he would go one or two nights during the week without a recurrence of the symptoms, until February 10, 1889, when he left the asylum.

CASE XVII.—Frank McC., aged five, has been two years in the asylum, during which time he has had nocturnal and diurnal enuresis. Prepuce elongated and tight, but can be retracted with a little force.

January 15, 1889.—Usual treatment, resulting in an immediate cure of the diurnal symptoms and a remission of the nocturnal symptoms,—*i.e.*, going two or three nights without wetting the bed and then a return of the symptoms,—until February 14, 1889, when the doses were doubled, since which time he has had a recurrence of the symptoms about two nights in twelve weeks.

CASE XVIII.—John T., aged six, has always had nocturnal and diurnal enuresis. Prepuce normal; meatus inflamed.

January 15, 1889.—Usual treatment, resulting in a cessation of the diurnal symptoms after the third day and of the nocturnal after two weeks.

CASE XIX.—Henry D., aged five, has been in the asylum one year, but has always had nocturnal and diurnal enuresis. Prepuce elongated but easily retractable; meatus inflamed.

January 15, 1889.—Usual treatment, resulting in immediate cure of the diurnal trouble with remissions of the nocturnal, until February 14, 1889, when the doses were doubled. Since the 16th of February there has been no recurrence of either symptoms.

CASE XX.—Charles S., aged eight, has always had nocturnal enuresis. Prepuce elongated but easily retractable; meatus normal.

January 15, 1889.—Usual treatment, resulting in a remission of the symptoms, until February 14, 1889, when the doses were doubled, since which time he has had a recurrence of the symptoms about two nights in the week.

CASE XXI.—Joseph S., aged eight (twin brother of Case XX.), has always had nocturnal and diurnal enuresis. Prepuce elongated but easily retractable.

January 15, 1889.—Usual treatment, resulting in an immediate cure of the diurnal symptoms and a remission of the nocturnal, until February 14, 1889, when the doses were doubled, and since the third day of their use there has been no return of the symptoms.

CASE XXII.—James T., aged three, has been six months in the asylum, during which time he has had nocturnal and diurnal enuresis. Prepuce elongated but easily retractable; meatus inflamed.

January 15, 1889.—Usual treatment, resulting in a cessation of the diurnal symptoms after the third day and a remission of the nocturnal symptoms, until February 14, 1889, when the doses were doubled, and since the 16th of February there has been no return of the symptoms.

CASE XXIII.—Michael H., aged six, has been three years in the asylum, during which time he has had nocturnal and diurnal enuresis. Prepuce elongated but easily retractable; meatus slightly inflamed.

January 15, 1889.—Usual treatment, resulting in the immediate cure of the diurnal symptoms, with marked remission of the nocturnal symptoms, until February 14, 1889, when the doses were doubled, and since February 16, 1889, there has not been any return of the symptoms.

CASE XXIV.—William T., aged twelve, has been over six years in the asylum, during which time he has had nocturnal enuresis. Prepuce and meatus normal.

January 15, 1889.—Usual treatment, resulting for the first three days in pains in the forehead with dimmed vision, but after that they passed away and a gradual remission of the

nocturnal symptoms, until January 31, 1889, since which time there has been no return.

CASE XXV.—Susan D., aged eleven, and Case XXVI., Mary H., aged twelve, have always had nocturnal enuresis.

February 5, 1889.—Usual treatment for each, with the astonishing results that they have not had a recurrence of the symptoms since that day. The treatment, however, was continued during the 6th, 7th, and 8th of February, when it was discontinued. On the 7th and 8th they each complained of pains in forehead and impaired vision, which entirely disappeared in a day or two.

CASE XXVII.—Nancy C., aged fifteen, and Case XXVIII., Josephine C., aged thirteen, have always had more or less diurnal enuresis, which, however, entirely ceased after the first daily doses of the solution (February 10, 1889), and has not since returned. Case XXVIII. complained of a fulness in her forehead the following day only.

CASE XXIX.—Honora B., aged nine, has always had nocturnal and diurnal enuresis.

February 10, 1889.—Usual treatment, resulting in an immediate cure of the diurnal symptoms and of the nocturnal after the fourth day of treatment.

CASE XXX.—John M., aged seven, has always had nocturnal enuresis. Prepuce and meatus normal.

February 10, 1889.—Usual treatment. February 17, 1889.—Mother reports that he has not wet the bed since the third night after taking the medicine.

From a careful review of these thirty unselected cases I am justified in saying that we have a remedy in sulphate of atropia—given to its full physiological effects—which is unequalled in our materia medica.

DIABETES MELLITUS IN CHILDREN.

BY DUDLEY P. ALLEN, M.D.,

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CASES of diabetes mellitus in young children are uncommon, so that a record of two cases, one of them carefully observed, may be of value.

J. R., aged three years and eight months, had always been healthy, and was an unusually bright child. His father enjoyed robust health; his mother was of a nervous temperament. One night in June it was noticed that the child passed an unusual amount of urine, and in September he occasionally wet his bed, but he was considered perfectly well until early in November, when the family physician pronounced his case one of catarrh of the bladder, on account of frequent micturition. An account of the case was given me December 11. I at once sent for a specimen of his urine and ordered it measured. December 13 the specimen of urine sent me contained sugar and had a specific gravity of 1028. The following day the child voided four quarts of urine. A non-farinaceous diet was ordered, and I sent for the child to be brought to the city, and I saw him first on December 16. He was weak and peevish, wanting to sit constantly on nurse's lap. Skin was dry; extremities were cold; thirst was marked.

He was placed on a pill of ferri redacti, gr. i, and opii, gr. $\frac{1}{3}$, three times daily, and Hunyadi Janos, \mathfrak{z} i, with Sprüdl, \mathfrak{z} iv, before breakfast. A strictly non-farinaceous diet was enforced.

December 18.—During last twenty-four hours he passed one quart of urine; specific gravity 1032. The amount of sugar was estimated at 51.2 grammes. Thus it will be seen the decrease in the amount of urine and sugar during five days under non-farinaceous diet was very marked. Patient weighed to-day thirty-two pounds.

December 22.—Stopped ferri redacti and opii, but continued the Hunyadi and Sprüdl.

December 24.—By advice of Roberts Bartholow, of Philadelphia, ordered the following: R Auri et sodii chlor., gr. ii; aq. 3iv. Sig. 5i, four times daily. R Sodii arsenitis et sodii phosphati, 5xv; aq. 3iv. Sig. 5i, three times daily. Patient's strength about the same. Food taken fairly well.

December 31.—Little change in his appearance, but he is possibly a little weaker.

January 8, 1887.—Patient has gradually lost flesh and strength. Until recently he has played about on the floor, but for several days has lain quietly in bed, sleeping most of the time. When roused, however, his mind is perfectly clear. Since all farinaceous diet was stopped patient has suffered less from thirst, but complains bitterly of hunger. During several consecutive days a strictly milk diet was enforced, but the amount of sugar excreted was not decreased thereby. An attempt was made to secure gluten bread, but analysis showed it to be full of starch, so it was discontinued.

January 9.—Has failed very rapidly, and this afternoon complains of intense pain in bowels. Is delirious; pain quieted by anodynes.

January 10.—Has slept without arousing for twenty-four hours, and died at 5 P.M. Almost no urine was secreted during last twenty-four hours. Analysis of urine made by myself.

December 13.—Specific gravity 1028. The amount passed the following day measured 4096 cubic centimetres.

December 18.—Quantity, 1024 cubic centimetres. Specific gravity, 1032. Amount of sugar 51.2 grammes.

The following analyses were made by an expert professional chemist:

Date.	Quantity in Twenty-four Hours.	Specific Gravity.	Amount of Sugar.
December 23.	1515 cubic centimetres.	1035	99.931 grammes.
" 24.	830 " "	1040	36.036 "
" 25.	855 " "	1040	36.2 "
" 26.	915 " "	1038	39.21 "
" 27.	880 " "	1040	53.9 "
" 28.	1080 " "	1038	52.92 "
" 29.	975 " "	1035	42.87 "
" 30.	..... " "	.....	..... "
" 31.	950 " "	1035	45.25 "

Date.		Quantity in Twenty-four Hours.	Specific Gravity.	Amount of Sugar.
January	1.	1480 cubic centimetres.	1035	81.80 grammes.
"	2.	1159 " "	1035	67.30 "
"	3.	1880 " "	1035	119.40 "
"	4.	1386 " "	1034	66. "
"	5.	786 " "	1032	32.80 "
"	6.	1288 " "	1035	88.35 "
"	7.	1258 " "	1040	110.60 "
"	8.	1115 " "	1040	91. "
"	9.	686 " "	1038	48. "

Post-mortem was made the morning following death. Examination of the thoracic and abdominal viscera disclosed nothing abnormal. The brain was unusually large, and there was an increased amount of sub-arachnoid fluid. There was also slight opacity of the lining membrane of the lateral ventricles. Aside from this nothing abnormal was discovered.

CASE II.—A. T., aged seven years. Previous health medium. Father and mother healthy. One great-uncle and two great-aunts died of diabetes, all being from forty to forty-five years of age. Saw the patient first, July 14, 1885. Five weeks before patient began to be languid, and had considerable thirst. At this time he got up three to four times each night to make water. This increased to from ten to twelve times in one night. Last night was up but once.

Has a voracious appetite, but is now much emaciated. Ate ordinary diet until two weeks ago, since which time the amount of farinaceous food given him has been decreased. This has resulted in a little improvement in his general condition. The urine, as measured by the parents, was—July 11, two and one-half quarts; July 12, two and one-half quarts; July 13, three quarts; July 14, two and one-half quarts. The specific gravity of this last specimen was 1040, and it contained 2130 grains sugar, estimated by Fehling's test.

Placed the patient on ferri redacti, gr. i, and opii, gr. $\frac{1}{8}$, three times daily. Also Hunyadi Janos water, enough each morning to produce one free evacuation daily, to which was added $\mathfrak{z}\text{v}$ Sprüdl. Placed patient on a non-farinaceous diet.

July 24.—Saw child again; has gained one pound in ten days. July 22 and 23, passed one quart urine each day. To-day has passed one and three-quarters pints, specific gravity

1026. Amount of sugar 746 grains. He is much more active than at last visit, and endures diet well.

August 6.—Saw patient for the third and last time. Has gained no flesh since last visit, but continues to gain in strength and activity. Urine passed in last twenty-four hours one and one-half pints, containing 480 grains sugar.

The patient then removed to Minnesota, and on October 1 I heard from his parents that he improved steadily until about September 1, and had gained considerable flesh, but later his condition had become less favorable. He had also grown very tired of his diet. The amount of urine did not again increase with the failure of the patient. The latter part of October I received word that the boy was dead.

Diabetes in boys so young as the first described has been rarely reported. That the disease progresses very rapidly in children is well illustrated by these two cases. Though the first case was under the most perfect supervision so far as feeding and care were concerned, the disease made constant and rapid progress. So far as we can discover, the disease meets a speedy and fatal issue when it seizes upon children.

Current Literature.

I.—HYGIENE AND THERAPEUTICS.

Finlayson, James: Collation of Recent Authorities on the Infective and the Incubation Period in Contagious Diseases. (*Glasgow Med. Journ.*, May, 1889.)

Several tables are submitted by the author as the basis for a code to regulate the attendance of children at schools in Glasgow, when they have been exposed to contagious diseases. The infective period controls the duration of the exclusion of the sick; the period of incubation, the time of quarantine for the healthy who have been in contact with infection. The following authorities are cited: Murchison, Vacher, Squire, Stephenson, Dukes, Alder Smith, Rewsholme, and the codes of several schools and hospitals. The accompanying table is a summary of those given by the author.

	Scarlet Fever.	Measles.	Rotheln.	Mumps.	Whooping-Cough.	Chicken-Pox.	Diphtheria.
Infective Period.	From earliest stage till all desquamation has ceased, five to eight weeks, average seven weeks.	From catarrhal stage till all desquamation and cough have ceased, three to four weeks from rash.	Ten to twenty-one days from appearance of rash, average fourteen days.	Till all swelling has subsided, two to three weeks.	From commencement of catarrhal stage till spasmodic cough has ceased, at least six weeks from whooping.	When every sensib has fallen, about three weeks.	Till throat is perfectly clear. Mild attacks two weeks. Severe attacks two to six weeks.
Period of Incubation.	One to eight days, usually two to three days.	Eight to fourteen days, usually ten days.	Ten to eighteen days, usually fourteen days.	Twelve to twenty-nine days, usually sixteen days.	Seven to fourteen days, usually fourteen days.	Ten to eighteen days, usually eleven days.	Two to five days, usually two days.
Period of Quarantine.	Ten to fourteen days.	Sixteen days.	Sixteen days.	Twenty-four days.	Twenty-one days.	Eighteen days.	Ten to twelve days.

Among 3497 cases of scarlet fever observed in 1888, the following complications were recorded: otitis, 362 cases; rhinitis, 338 cases; albuminuria, 867 cases; measles, 55 cases; whooping-cough, 36 cases; diphtheria, 35 cases. Between October 23 and January 1, 99 cases of diphtheria were admitted. Of these 10 had been discharged and 46 had died.

Statistics of the Infectious Hospitals of London. (*British Med. Journ.*, May 25, 1889.)

Of the total number of cases admitted to these hospitals during 1888, four thousand four hundred and eight, or eighty-eight per cent., were cases of scarlet fever. Several interesting tables upon this disease are given. One of these, founded on the total experience of the Asylums Board with scarlet fever, is of especial interest. It shows that the mortality of children attacked under five years of age is nearly five times as great as among children between ten and fifteen.

Ages.	Percentage Mortality.	Ages.	Percentage Mortality.
0 to 5	21.81	30 to 35	7.85
5 " 10	8.36	35 " 40	8.39
10 " 15	4.55	40 " 45	10.71
15 " 20	4.22	45 " 50	4.76
20 " 25	3.87	50 " 55	5.00
25 " 30	4.93	55 and upwards	50.00

The Prevention of Blindness from Ophthalmia Neonatorum. (*British Med. Journ.*, May 25, 1889.)

During discussions in the House of Commons, attention was directed to the immense amount of blindness resulting from the ophthalmia of new-born infants. Attempts were made to induce the government to diffuse among the poorer classes a knowledge of the disease and necessity for its prompt treatment. It is a reflection upon our civilization that a disease which is both preventable and curable should be allowed year after year to blind some hundreds of children. Much might be done to check the evil by instruction of nurses who assist the poor, and by impressing parents with the dangers of the disease and necessity for prompt treatment.

Raven, Thomas F.: Incubation Period of Measles. (*British Med. Journ.*, May 25, 1889.)

A case of measles was imported into an institution containing four hundred and fifty children. Twelve days later a second case occurred. This, like the first, was at once isolated. Three days later a third case developed, in which the period must have been either three or fifteen days. In the next case the period must have been either six or eighteen days, and in another fourteen or eleven days. The next and last case appeared twelve days after exposure.

Collins, W. J.: An Outbreak of Cow-Pox. (*Lancet*, June 8, 1889.)

The author has studied an outbreak of an eruptive disease affecting the teats and udders of milch-cows kept on a single farm. The disease followed the introduction into the farm of two new cows. No other source of infection could be found, and no smallpox had been known in the neighborhood for a long time. Milk used from these cows for a time did not propagate scarlatina. The author further discusses the nature of this disease,—cow-pox in the cow and vaccination in the human subject. Bacteriology gives no help in establishing the identity. Many varieties of micro-organism will colonize out of a tube of vaccine lymph. Search has been in vain for one that will determine the sequence of events we recognize as vaccination.

Demme: The Use of Strophanthus in Children. (*Rev. Mens. des Mal. de l'Enf.*, February, 1889.)

The following conclusions resulted from the author's experiments:

1. Strophanthus, especially in the form of the tincture, may be given to children after their fifth year. In exceptional cases its use is followed by dyspeptic troubles. But as this agent in large doses may paralyze the cardiac muscle suddenly and unexpectedly, it should not be given in larger than three-drop doses, four or five times daily.

2. The predominant action of strophanthus is to increase diuresis, and consecutively to diminish the phenomena of venous stasis. This effect is produced by an increase in the blood-pressure, and is especially evident in connection with valvular lesions of the left auriculo-ventricular orifice, while the strophanthus does not, like digitalis, determine a compensation of the valvular lesion. In affections which are accompanied by exaggerated or even normal arterial pressure, the diuretic action of strophanthus is wanting.

3. Strophanthus also exercises a remarkable influence upon dyspnoeal phenomena. This is due to the action which it also exercises upon the respiratory centres. This is seen in cases of chronic nephritis, and in such other diseases as bronchial asthma, whooping-cough, etc.

4. While there are great analogies in more than one respect between the effects of strophanthus and those of digitalis, each one possesses its own peculiar therapeutic action. Digitalis will be indicated in cases in which one wishes to obtain with rapidity a compensation for valvular lesions, with augmentation of the blood-pressure, slowing of the pulse, and exaggeration of

the urinary secretion. If digitalis does not produce these desired effects, they cannot be obtained with strophanthus. On the contrary, when a valvular lesion has been compensated by the use of digitalis, and it eventually becomes necessary to act anew upon the heart, in order to obtain a new increase in the blood-pressure, and a new increase in diuresis; when, in addition, dyspnœa becomes an urgent phenomenon, strophanthus will give excellent results. In such cases the combined action of digitalis and strophanthus will be indicated.

5. In no case did the author observe cumulative effect, nor weakening of the action of strophanthus, even after it had been used for a long time.

A. F. C.

Fagonski: Certain Methods for Dressing the Navel-Wound in New-Born Infants. (*Jahrb. f. Kinderh.*, xxix. 1.)

Bearing in mind the experience of Liborius, Virchow, and others, concerning the antiseptic properties of the lime-salts, the author made use of a dressing of plaster of Paris for the navel stumps of one hundred new-born infants, the stumps having first been disinfected with a five-per-cent. solution of carbolic acid. In a similar series of one hundred he used a stump dressing of salicylic acid and starch after Runge's method, of talc powder, and of absorbent cotton. The results are expressed in the following table:

	Plaster of Paris.	Talc.	Salicylic Acid or Starch.	Cotton.
Erosions of the navel region.....	4	5	2	3
Hemorrhage	7	10	8	4
Icterus	6	8	8	18
Ophthalmia neonatorum.....	3	5	6	1
Periophthalmitis.....	2	48	51	29
Moist gangrene of cord.....	0	30	65	27
Mummification of cord.....	100	70	35	73
In days.....	2-3	5-6	5-6	4

The navel-cord stump in the first series fell usually on the fifth day, never later than the sixth; in the second series usually after the sixth day; in the third series also usually after the sixth day; the same was true for the fourth series. The requirements for a good dressing for the navel, that it should favor rapid and complete mummification of the stump, and hinder the entrance of pathogenic micro-organisms into the wound, are therefore best satisfied by the use of plaster of Paris, which acts antiseptically and hygroscopically.

A. F. C.

Karlinski: Etiology of Puerperal Infection in New-Born Infants. (*Jahrb. f. Kinderh.*, xxix. 1.)

It is a remarkable fact that at the time of epidemics of puerperal fever in lying-in hospitals many of the children

succumb quickly with symptoms similar to those of the women. The point of entrance for this infection in the new-born, aside from intra-uterine transmission, has been considered to be the navel or some other external wound. Infection may also be due to aspiration of septic material, and the author believes that the milk of septic puerperæ contains pyogenic germs, and that these are bearers of infection. In the milk of two such women, the nipples being completely intact, he has found the *Staphylococcus aureus* and *Staphylococcus albus*. In the first of these he found in eight plate-cultures of milk which was removed with all possible precautions: *Staphylococcus pyogenes aureus*, six times; *Staphylococcus pyogenes albus*, four times; *Staphylococcus pyogenes citreus*, two times; *Staphylococcus pyogenes cereus albus*, four times; *Staphylococcus pyogenes cereus flavus*, three times. The same varieties, with the exception of the *cereus albus*, were found in milk taken from a puerperal-fever patient just after death. The child of the last-mentioned woman was not nursed, and remained healthy. That of the first, which was nursed until the fourth day of life, was seized on the fifth day with rise of temperature; on the sixth day there was swelling of the parotids and acute intestinal catarrh, from which the child died on the tenth day. The autopsy showed the umbilical vessels intact, but in other respects there were decided septic changes. In the cultures of blood removed from the vena cava, umbilical, external jugular, and splenic veins the same microbes were found as had been found in the mother's milk.

A. F. C.

Dubousquet Laborderie: Treatment of Diphtheritic Angina. (*Journ. de Méd.*, January 20, 1889.)

The method which is advocated is that of Gaucher, which consists in the ablation of the false membrane and antiseptic cauterization of the underlying mucous membrane. Since 1884, the author, in conjunction with Gaucher, has practised it in one hundred and two cases, with only four deaths. Three of the deaths were caused by extension of the false membrane to the larynx, the infants being very young, and the fourth was due to general infection with broncho-pneumonia occurring secondarily to measles. These results were obtained by watching every case with the greatest care, and attending personally to the minutest details of treatment. The opinion is ventured, as the result of this experience, that diphtheritic angina in adults and in children who have passed the earliest period of childhood is not a disease with so grave a prognosis as has heretofore been usually given. The objections to the method are that it seems brutal to the parents, and may cause

some pain. If the disease is attacked very soon after its beginning, the fever will disappear. The urine was dark in color in some of the cases, but there was no evidence of extensive intoxication. Not only must the epithelium be destroyed, the subjacent mucous membrane must also be cauterized. It is not maintained that the method is infallible; in some cases the rapid extension of the membrane to the larynx cannot be prevented, in others there is general infection from the first, and in others one is called too late for the cauterizations to be of any service. Gaucher has used injections of one-per-cent. solutions of carbolic acid in addition to the cauterizations, and has seen the disease limited to six or seven days thereby. If the cauterizations alone are used the disease usually lasts ten to twelve days. The applications are of pure carbolic acid, and are made with a brush, the diseased surfaces being thoroughly rubbed with it. This operation must be done morning and evening, and once in the night if the membranes are rapidly reproduced. The irrigation with one per cent. of carbolic acid should be made every two hours, and also after each cauterization.

A. F. C.

II.—MEDICINE.

Mitchinson: Acute Chorea. (*Lancet*, May 11, 1889.)

This paper is a history, with remarks on two cases of acute chorea terminating fatally. A remarkable feature in these cases is the high temperature in each. In both patients there was well-marked mitral disease found after death. The first case had had four previous attacks. This case was marked by a high temperature throughout, ranging from 102° to 107.6° . The second case was suffering from a first attack following an attack of acute articular rheumatism eight weeks previously. The temperature in this case followed the usual course in fatal cases, rising rapidly a few hours before death. These two cases are of interest as examples of that acute form of chorea occurring about puberty which is not infrequently fatal. In both the inutility of the ordinary treatment was well shown; bromide of potassium producing no quieting effect, and morphia by itself causing more excitement, while in each case the movements were subdued immediately by the inhalation of chloroform. In the second case the ether spray applied along the spine, so far from producing a beneficial effect, increased the movements. The continuous inhalation of chloroform was adopted, in the hope that by checking the great expenditure of nerve-force the nerve-centres might recover their equilibrium, while the general nutrition was kept up by feeding through the nasal tube.

Suckling: Sporadic Cretinism. (*Lancet*, May 4, 1889.)

The child had had a peculiar voice and protruding tongue since birth. There was a history of neurotic trouble in the family. The child had exactly the appearance of myxœdema. The nose was broad and flat. The skin was rough, cold, swollen, and cyanotic. The child was stunted. The forehead did not recede much. The teeth were all decayed, and the hair was coarse and scanty. The fontanels were closed. The arms and legs were short, the body long, but the abdomen was not much swollen. The child was of a placid disposition; it could only utter a few words, and was quite unable to stand. No trace of the thyroid could be felt. The neck was short and thick, and there were no fatty tumors in the posterior triangles. The child's condition had not followed on any infantile disease, but had been present from birth.

Suckling: Hemiplegia from Inherited Syphilis. (*Lancet*, May 4, 1889.)

The boy was three years of age. He had suffered from snuffles and mucous patches about the anus and mouth when three months old. When two years of age choroiditis disseminata and nystagmus were discovered. The child did well on iodide of potassium and hydrargyrum cum creta. A few weeks ago the child complained of headache, and shortly afterwards became hemiplegic. The movements on the paralyzed side were weak and tremulous. The choroiditis was still present to the same extent as when first discovered.

Barrs, Alfred G.: Double Congenital Hydronephrosis. (*Lancet*, May 18, 1889.)

The patient, a man aged thirty-one years, had been well up to three years previously, when immediately following a stooping movement he had a sharp, sudden pain, followed by vomiting. He was carried home, but was able to work the next day. Thus he continued for three years. For the last nine weeks he had suffered from vomiting daily. Œdema of the face and hæmaturia developed. A large mass was found occupying the right lumbar region. Eighteen ounces of fluid were drawn from the tumor, but he continued to grow worse. Necropsy showed that both kidneys were converted into cysts, but the left was smaller. The ureters were small and not dilated, but they were inserted in such a way that they at first caused but little obstruction. Gradually they came to cause more and more as the pelvis filled, until a marked obstruction resulted.

Nicholson, Frank: Pseudo-Hypertrophic Muscular Paralysis. (*Lancet*, June 1, 1889.)

The above condition occurs in family groups more frequently than as isolated cases. In this case it occurred in four brothers of one family. The parents are in good health, and there is no history of any hereditary disease. There were eleven children in the family. The other seven were healthy, with two exceptions. The disease began in early life. Then for several years the muscles of the thighs and calves would become larger, while the gait was swaying and peculiar, the back being much arched and the shoulders thrown back. The latter history was marked by atrophy of the affected muscles until the patient was not able to walk or stand. Intercurrent disease was generally the cause of death.

Longstaff, G. B.: Geographical Distribution of Diphtheria. (*Lancet*, June 15, 1889.)

This report is issued by the Local Government Board. The observations were made in England and Wales. From a study of certain named districts it appears that the mortality is highest where the population is "medium" or "sparse" in density. This report covers a period of twenty-six years. It shows that each succeeding decade is marked by an increasing mortality in towns, relatively to the rural districts. There is also evidence to show that very many of the largest towns suffer less than the villages and small country towns. The report shows the fact that the mortality of the disease in females is seven per cent. in excess of males.

Pasteur, William: Transient Local Asphyxia Determined by a Dog-Bite. (*Lancet*, July 6, 1889.)

An anæmic boy, aged nine years, was bitten on the back of the hand by a dog. The boy had snuffles in early childhood, and is now suffering from ulceration of the back of the pharynx, probably syphilitic. He has never suffered from cold hands or feet and is sure that they never turned blue. On the first two days the hand was slightly blue. On the fifth day the wound began to suppurate, and on the same day the whole hand became icy cold, very painful, and of a deep blue-black inky color. The discoloration reached half-way up the forearm, and was of a uniform color. There was no venous mottling above the discoloration. The radial pulse on the affected side was decidedly less full than the corresponding limb. Several attacks occurred after this time, but they were usually mild. Sensation was never blunted to any considerable extent. After the wound was healed a well-marked attack occurred.

The left hand is now often colder than the right. Anæmia and syphilis may be held to have been predisposing causes in this case, but there seems no reason to doubt that traumatism was the determining cause. In the remarks attention is drawn to the asymmetry, local distribution, and primary location in the wounded extremity. It is also interesting to note, in connection with the reflex vaso-motor-neurosis theory of Raynaud's disease, that in the present instance there was a well-defined source of irritation in that part of the periphery which subsequently became the seat of the asphyxia.

Barrs, Alfred G.: A Case of Sclerema Neonatorum. (*British Med. Journ.*, May 4, 1889.)

The case was a marked example of this curious and rare disorder. The eruption was limited to the lower extremities and a portion of the nates covered by the napkin. It had a dry and polished appearance, and the firmest pressure produced not the slightest pitting. A half-grain of gray powder was administered night and morning, and in two months the induration had entirely disappeared.

Van Puterem: Micro-Organisms in the Stomachs of Children. (*Jahrb. f. Kinderh.*, xxix. 1.)

The author sought to determine whether there were micro-organisms which play a physiological rôle in the stomach, as Escherich determined was the case in the intestine, the agent being the *bacillus lactis aërogenes*. For this purpose investigations of the contents of the stomach were made in forty healthy infants between the ages of four and seventy-seven days, which had first been nursed at the breast and then with a milk-and-water mixture. A sample of the contents of the stomach was removed with a sterilized sound after carefully cleansing the mouth, and cultivated in the usual manner. Plate-cultures to the number of one hundred and ten were made, of which fifteen were from children who were fed artificially, and ninety-five from those who were fed at the breast. Of the latter, fifty-nine were from children who suffered from *thrush*, while the remaining thirty-six were free from it. The micro-organisms obtained from the thirty-six were comparatively few in number. Those who were artificially fed had twenty times more micro-organisms than those who were breast-fed, and those who had *thrush* had forty times more micro-organisms than those who were free from it. If the mouth were cleansed before and after eating in those who were without *thrush*, it was found that in sixteen per cent. of such cases the contents of the stomach would be free from bacteria. The *oidium albi-*

cans was not found in artificially-fed children who had no thrush. The *bacillus lactis aërogenes* was found in 37.6 per cent. of those who were nursed at the breast and in forty-five per cent. of those who were artificially fed. Non-soluble cocci were found in 12.9 per cent. of the breast-fed and in 54.4 per cent. of the artificially-fed cases. *Oidium lactis* was in 12.9 per cent. of the breast-fed and in 27.3 per cent. of the artificially-fed. *Staphylococcus pyogenes aureus* was in 16.4 per cent. of the breast-fed and in 27.2 per cent. of those who were fed on cow's milk, but all the children in whom this microbe was found were perfectly healthy. *Bacillus subtilis* was in 11.7 of the first and 36.8 of the second class. *Bacillus butyricus Heneppe* was found in every case in which cow's milk was given. Fine, short-rod bacteria were in 9.4 of the first class and 18 of the second. *Bacillus fluorescens liquefaciens* was in 27.3 of the second class. The conclusion was drawn that no single variety of bacteria was found in the stomach so constantly and in so great numbers that one must feel that it exercised a physiological function upon the digestive activity. The numbers of micro-organisms in the stomach do not vary greatly during the different stages of digestion. A. F. C.

Woodhead: Tuberculosis and Tabes Mesenterica. (*Jahrb. f. Kinderh.*, xxix. 1.)

A careful analysis of one hundred and twenty-seven cases of fatal tuberculosis in children showed that the disease selects particular organs, by preference as it were, at different periods of life. In the tabulated series it appeared that the intestinal canal was involved in only forty-three of the one hundred and twenty-seven cases, while the mesenteric glands were involved in one hundred, of which sixty-two occurred between the ages of one and five and a half. The most common cause of primary localization of tuberculosis in the mesenteric glands was thought to be the use of milk containing the tubercle bacillus. Most of the cases in the table were breast-fed during the first year of life, and there were few deaths during that period, tuberculous mastitis in adults being a very rare affection. Tuberculous mastitis in children is, however, quite common, and it is probably due to the fact that so much tuberculous cow's milk is used as food for children between the ages of two and five. In addition, the great functional activity of the glands at this period of rapid growth may produce an exhausted condition of those glands which renders them less competent to resist the influence of the tubercle bacillus than at other times. In addition to the analysis referred to, the author investigated the condition of six hundred cows in the stables

of Edinburgh. Among them were found thirty-seven which had tuberculous mastitis, but in the milk of only six of these could the tubercle bacillus be found. The tissues of the diseased organs were, however, abundantly supplied with tubercle bacilli and giant-cells. The disease was widely disseminated in the course of the interlobular lymph-tract. Granulations abounded in the lumen of the milk-ducts; then followed ulceration, and thence the tubercle bacilli readily found their way into the milk.

A. F. C.

Uspenski: Hypertrophy of the Tonsils in Childhood. (*Jahrb. f. Kinderh.*, xxix. 1.)

In order to determine the relations of hypertrophy of the tonsils in childhood to the general physical and psychical development of the children concerned, the author examined the pupils of two military schools between the ages of ten and fourteen, finding among them fifty-two cases in which hypertrophy existed. Of these cases twenty were deficient as to height, weight, and circumference of the chest for their respective ages. A few were myopic; thirty-seven lacked acuteness of hearing; most of them were anæmic, with weak and hoarse voice. Breathing through the nose was difficult and obstructed in most of the cases. With the tonsillar hypertrophy was also granular or atrophic pharyngitis in almost every case, and in many there was swelling of the glands of the cervical and submaxillary region. In twelve cases the uvula was deviated to the right, in eight to the left; but this had no bearing upon the hearing in these cases. In eighteen of the cases the father was dead, in seven the mother, the cause of death in most cases being some form of chest-disease. The conclusion which was drawn from the study of these cases was that between tonsillar hypertrophy and physical and psychical development there exist relations which rest for the most part, if not exclusively, upon heredity.

A. F. C.

Roux and Sersin: The Microbe and the Poison of Diphtheria. (*Gaz. Méd.*, January 12, 1889.)

The results of the investigations of these authors appeared originally in the *Annales de l'Institut*, Pasteur, December 25, 1888, and lead one to hope for a more effective action of the means of treatment of this deadly and rebellious disease. The experimental studies of Klebs, Loeffler, G. Hoffmann, and others upon the bacillus of diphtheria are reviewed, and the existence of the microbe described by Klebs is confirmed. They have also brought forward a fact for the establishment of its specific character which other experimenters have not

observed,—namely, that diphtheritic paralysis may be produced by inoculations of cultures of the bacillus into the pharynx and trachea, or by injections into the veins. The disease which has been produced by them in animals upon which they have performed this experiment is in all respects identical with the diphtheria of human beings. But this is not all; for the authors, being convinced that the bacillus of Klebs acts upon animals who have succumbed to the diphtheritic infection only in the area of the false membranes, or at the point of inoculation, and not in the organs, have concluded that the effect of the bacillus is due to the poison which it secretes, and have sought for that poison in culture media. Their method of investigation was as follows: They filtered upon porcelain a culture in real broth, after it had remained seven days in an oven, all the microbes being retained by the filter, and the resulting liquid being perfectly limpid and weakly acid. This fluid contained no living organism; left in the oven no change occurred; and, when alkaline *bouillon* was added, still no culture could be obtained. When it was introduced in quantities of two to four cubic centimetres under the skin of animals it did not make them sick. But this was not the case when much larger quantities were used; when, for example, thirty-five cubic centimetres were injected into the peritoneal cavity of the guinea-pig, or into the veins of a rabbit. Immediately after such an operation a guinea-pig appeared well enough, but after two or three days his hair became roughened, his appetite failed, a bloody discharge flowed from the urethra, the animal became weaker and weaker, and finally died on the fifth or sixth day after the injection. An autopsy showed congestion of the axillary and inguinal glands, dilatation of all the vessels, especially those of the kidneys and supra-renal capsules; the urine was bloody, there were ecchymoses along the course of the vessels, and the pleuræ contained serous exudate. The intensity and the rapidity of action of the poison depended upon the quantity which was contained in the culture. If the effects of injections of cultures deprived of microbes were compared with that of inoculations of a fresh culture of Klebs's bacillus, the symptoms and lesions, it was found, were identical. Animals such as mice and rats, which were refractory to the bacillus, were equally refractory to the diphtheritic poison. The question is asked whether this poison is an alkaloid or a diastase. The diminution of its activity under the influence of air and heat tends to lead one to adopt the second hypothesis, and the question arises whether, with the poison thus attenuated, one can obtain, in animals, first, habituation to it, and then immunity

from diphtheria. This great end is the object of new researches on the part of Roux and Sersin. They have discovered an important practical fact, which is that the microbe of diphtheria will only develop upon a mucous membrane which is already diseased. Hence the necessity in all cases of angina in children, even in the most benign of them, to keep the mouth and pharynx well irrigated with carbolic-acid solution, carbolic acid being the antiseptic which is most potent against diphtheria. It is possible that the bacillus of Klebs, as an observation of Loeffler would tend to demonstrate, exists normally in the mouth and remains inoffensive as long as the mucous membrane is healthy. Another point which may be deduced from the author's work is the following: if the bacillus of Klebs will only develop and proliferate in the area covered by false membrane, general infection, due to the poison which is secreted by the bacillus, must always be secondary, and therefore can and ought to be prevented by local antiseptic treatment, sufficiently energetic in character, directed to the part which is invaded by false membrane. In this connection it is noted that the local treatment of diphtheritic angina is coming more and more into favor among clinicians.

A. F. C.

Baudouin: Tuberculosis of the Cervical Region of the Vertebral Column. (*Rev. Mens. des Mal. de l'Enf.*, December, 1888.)

Notwithstanding the great frequency of Pott's disease of the cervical vertebræ, this disease is still not well understood. Those who have written upon the subject have not given complete didactic descriptions showing this localization of the tuberculous process in the vertebral column. The author thinks more attention should have been given to the initial symptoms, with their pathological physiology, and to the accidents of nervous origin which are more frequent and more striking in the cervical variety of Pott's disease than in tuberculosis of the lower regions of the vertebral column. Another important point which has not been sufficiently elucidated is the exaggeration of the tendon reflexes at the beginning of Pott's disease. Two cases which are narrated in detail illustrate these nervous phenomena, and also those of contracture, very forcibly. The pain, the contractures, and the exaggerated tendon reflexes are carefully discussed. Pain is the first sign in the disease which excites attention. This may be at the seat of the injury or at a distance from it, and of a pseudo-neuralgic radiating character. The local pain may be spontaneous or provoked. If spontaneous, it may be at a fixed

point of a cervical portion of the column, or it may be localized along one of the nerves of the neck, near the line of the spinal apophyses. It may be a fixed pain, or it may be of a darting, burning character. Provoked local pain may be due to pressure, or to movements of the head. It usually is present long before deformity occurs. Aside from the local pain there are frequently painful radiations which may even precede the fixed local pain. They are sometimes called pseudo-neuralgic pains, and involve branches of the cervical plexus and sometimes the brachial plexus. In such cases there is neuritis in the nerve-trunks which proceed from or in connection with the tuberculous process. The contractures in this disease occur almost as soon as the pains, and are very evident in the muscles connected with the nucha. The muscles may all be involved in the process at once or they may be attacked successively. One side may be more extensively affected than the other, with corresponding deformity in the neck. As to the pathological physiology of these contractures, they may be due to a medullary lesion, an alteration of some kind or another in the nerve-elements, or the phenomena may be entirely of extra-medullary origin. The latter is probably the case, though later in the disease there are contractures which are due to anatomical lesions of the spinal cord. If they are extra-medullary they are to be considered as spasmodic,—that is, of reflex origin, and may be due to prolonged excitation of centripetal sensory nerves in the region of the tuberculous foci of the cervical portion of the vertebral column. The initial contractures in Pott's disease have nothing in common, from a pathogenic stand-point, with those which attend the post-paralytic period, when compression of the cord has induced sclerosis of the pyramidal fibres. The initial contractures are reflex, but the point of departure of the reflex is not peripheral but central, residing in the fibres of the diseased lateral bundles. Exaggeration of the tendon reflexes is a specific character of the spasm or spasmodic movements in this disease. It occurs late in the disease, but is not attributable to a lesion of the medulla. It is due to simple excitation of the motor cells of the anterior horns of the cord, being a phenomenon of the same kind as the contractures at the beginning of Pott's disease. But if there is paralysis the exaggerated tendon reflexes are due to irritative lesions of the pyramidal bundles. In regard to the etiology of this disease, Sayre states that it is usually of traumatic origin. The author admits that trauma has much to do with the disease in many cases, but believes that the true cause is the development of the tubercle bacillus in the vertebral

bodies. With this view of the disease, Lannelongue's term, vertebral tuberculosis, becomes very appropriate and exact.

A. F. C.

III.—SURGERY.

Smith: Anchylosis of the Knee-Joint as a Remedy for the "Dangle-Leg" due to Infantile Paralysis affecting the Entire Limb. (*Medical Record*, April 6, 1889.)

The author has done this operation of anchylosing the knee-joint in several cases, and always with success; he therefore advocates this treatment in preference to apparatus or amputation with the attendant discomforts of an artificial limb.

He quotes his first case in detail. The patient was ten years of age, and had walked with a crutch since three years old. At first a tenotomy was done upon the flexor muscles with the view of straightening the knee, and then applying apparatus to fix the knee-joint. After division of the tendons the leg could not be straightened, owing to the tension of the soft structures in the popliteal region. Failing in this, the author decided to excise the joint. The joint was opened by dividing the patella. Then four thin sections were taken from the femur, which allowed of the tibia being brought into proper position. Two wire sutures were inserted to keep the femur and tibia in apposition; the two halves of the patella were held with one suture. The wound healed without supuration, and in four weeks the patient was moving around on crutches; at this time there was considerable movement at the knee. In eight weeks he could bear some weight on the limb, and, though consolidation was more firm, it was not complete. In twelve weeks he was walking without cane or crutch; there was still slight motion at the knee. In four months the union, though fibrous, was firm, and no motion could be detected.

Similar results have attended his other cases. The patients soon acquire a gait that hides the stiffness of the joint, so that it is almost impossible to detect the infirmity. The author thinks the best cases for operation are those in which the atrophied limb is only slightly shorter than the sound member. In some cases he excised both the femur and tibia; here union was more rapid than where only the femur was excised, but the leg was much shorter. He therefore gives a preference to the slower process of repair, since the results are better.

Ridge: Naso-Laryngeal Intubation in Diphtheria. (*British Med. Journ.*, October 13, 1888.)

The author describes a new form of intubation, which he has made use of in four cases with relief of the impending suffoca-

tion. The cases were from three to seven years of age. A No. 10 gum-elastic silk catheter is used. The eye is cut off and the nicely-rounded end introduced. It is coated with vaseline and slipped along the nostril, while the forefinger of the other hand guides it into the larynx. In all of the cases mucus was coughed out through the tube; air passed in and out freely, both through and around the tube. All food and medicine must be given per rectum while the tube is in position. The author believes that one of his patients died from pneumonia induced by liquid food entering the lung. Beef-tea was given in this case contrary to orders. The author proposes to pass a similar catheter along the other nostril at the same time, but into the œsophagus, so that food may be administered thereby from time to time. The tubes will be plainly marked so that food will not be sent into the larynx. A tape is passed around the head to hold the tube in position.

Pasteur: Gangrene of the Lung; Incision with Counter-Opening; Death; Autopsy. (*British Med. Journ.*, October 20, 1888.)

A boy, aged seven years, coughed up a quantity of blood the day he came under observation. It was said that his illness developed rapidly, but came on insidiously. Ten days after the onset he was febrile, with quickened breathing, accompanied by a gangrenous odor. During the next three weeks cavity-signs developed at the right apex, and the remainder of the right lung became pneumonic. He spat up daily from two to four ounces of stinking, watery fluid, mostly saliva. Three weeks after admission the cavity was incised at the anterior extremity of the right second space, one inch from the sternum. A large quantity of gangrenous lung and putrid fluid was expelled. The cavity reached down to the sixth space. A counter-opening was made there and drainage-tubes put in. The cavity was washed out once or twice daily. The boy showed marked improvement for ten days, when the symptoms reappeared and he died three days later. It was found at the necropsy that a cavity occupied the anterior third of the right lung. At the inner margin the necrotic process had invaded the pericardium and set up acute pericarditis. The œsophagus was firmly adherent to the right bronchus, and a narrow sinus, about three-quarters of an inch long, led from a minute valve-like opening in the œsophagus to a small ragged opening in one of the main divisions of the right bronchus. There were no signs of tubercle or of caseating or suppurating glands. The gangrene was undoubtedly due to the passage from the œsophagus into the lung of some irritative material. Whether the

sinus was the remains of a glandular abscess or was caused by the passage of some pointed foreign body from the œsophagus, was doubtful. The implication of all three lobes in a cavity and pericarditis developing are worthy of notice.

Owen, Edward: Intracranial Hemorrhage; Operation; Recovery. (*British Med. Journ.*, October 13, 1888.)

A boy, nine years old, was stunned by a fall from a cart. The symptoms were vomiting, photophobia, drowsiness, and mental irritation. There was no paralysis, and no fracture could be detected. On the fifth day convulsions set in, at first involving the right facial and supra-hyoid group of muscles. There were several convulsions on this and the following day. The muscles of the right upper extremity, the right sternomastoid, and the diaphragm became involved during the attacks. He did not lose consciousness, but was aphasic. Sensation was perfect over all the affected parts,—sure evidence that only the motor area was implicated. On the seventh day he was still aphasic, though conscious. Twitching of the muscles of the right side of the face and of the right forearm and hand persisted. That the pressure was due to extravasation of blood, and not to a depressed fragment of bone, was evinced by the fact that the symptoms did not occur directly after the fall. Abscess was excluded by absence of rise of temperature. The position of the fissure of Rolando was marked on the scalp by a line drawn from the vertex at a point directly above the external auditory meatus to the depression just in front of it, and prolonged on to the mesenteric region, so that during the operation there would be a guide to the fissure. A quantity of fluid and clotted blood was removed from beneath the dura. The patient improved, but there was a persistence of some of the symptoms; accordingly, the wound was again opened, and beneath the arachnoid a small quantity of dark fluid blood was found. Gradually speech and complete muscular power returned. The patient was discharged cured four weeks after the operation.

Annandale, Thomas: Intubation of the Larynx; a New Instrument as an aid to Certain Operations. (*British Med. Journ.*, March 2, 1889.)

In operations involving the mouth and naso-pharynx, in which bleeding may take place into the air-passages, and interfere with respiration, or in operations in which respiration is not satisfactory during the administration of an anæsthetic, intubation of the trachea can, in most cases, be substituted for preliminary tracheotomy, and is a simpler and safer means of aid. As a means of restoring and carrying on respiration in

cases of sudden obstruction in the larynx or trachea, intubation may also be substituted for tracheotomy. For these purposes the author successfully employed a gum-elastic catheter. Owing to certain disadvantages, he had constructed an elastic tube (not too pliable), having a slide of hard rubber which can be adjusted in any position to prevent compression by the teeth. To the end of the tube protruding from the mouth there can be attached a piece of tubing, through which an anæsthetic may be administered if desired. For intubation in cases of acute inflammatory affections of the larynx, or for stenosis of the larynx, the result of chronic inflammatory conditions, or of accidental wounds, the author uses the tubes of Dr. O'Dwyer.

Griffith, Thomas Winthrop: *Fifty Consecutive Cases of Empyema.* (*Medical Chronicle*, March, 1889.)

In this paper the author gives in tabular form the clinical history of fifty cases in which pus was present in the pleural cavity, and then goes on to a consideration of these cases. The series is made up of consecutive cases, and includes all occurring during the given time in one institution.

Out of twenty-five hundred cases of all description passed through the medical wards in three and one-third years, no fewer than fifty were cases of empyema. The disease is thus rather a more common affection than one is usually led to suppose.

With regard to age, the author has arranged the cases in groups corresponding to the first seven decades, and has contrasted them with fifty cases of pleurisy with effusion. In the cases of empyema the great majority occur during the first decade.

TABLE showing age, sex, and side affected, contrasted with fifty cases of pleurisy with serous effusion.

	Empyema.	Serous Effusion.
I. Age—1 year to 10 years.....	29	10
10 years " 20 "	7	16
20 " " 30 "	8	7
30 " " 40 "	1	9
40 " " 50 "	4	6
50 " " 60 "	1	1
60 " " 70 " .....	...	1
II. Sex—Males.....	33	40
Females.....	17	10
III. Side—Right.....	19	22
Left.....	26	26
Both.....	1	...
Not noted.....	4	2

The author does not think that many cases of empyema originate in serous effusions of long standing. He is led to

this conclusion from a consideration of the following facts: During all the time he was resident at the Leeds Infirmary, many cases of pleurisy with effusion were treated by tapping or aspiration. In all these cases—and he himself drew fluid from the chest by tapping or aspiration two hundred times—there were only two cases in which the fluid was clear at first and became purulent subsequently. One of these cases was the subject of extensive tuberculosis, and the other contracted facial erysipelas. The writer gives a careful and detailed description of the method which he has adopted in performing this small operation so successfully. In speaking of the physical signs, attention is called to the fact that one must not expect too much assistance from the shifting character of the dullness as a point of diagnostic value between consolidation and fluid. The lung does not float like a cork on the surface of the fluid, ready to change its position on a change of the patient's posture. Again, it is quite common to find a combination of dullness and increased vocal fremitus in cases of long-standing effusion, when the fluid is either diminishing by absorption or has been partially withdrawn, and this in the absence of consolidation. Œdema of the tissues of the intercostal space is of questionable value.

Exploratory puncture is done with an instrument slightly larger than an ordinary hypodermic syringe. No harm ensues from this proceeding; and cases are often overlooked from its omission. We may fail to detect pus from a variety of causes; but when from the symptoms we have a reasonable suspicion that pus exists, we should go on *until we find it*, anesthetizing the patient if necessary. In one case nine punctures were made before pus was found. Expectoration of even a large amount of pus from an empyema is not, it would appear, at all necessarily associated with the formation of a pneumothorax: possibly the opening from the pleura into the lung in many cases is valvular, or, at all events, may permit of pus being squeezed through it by the strong expiratory efforts of cough, without allowing air to pass in the opposite direction.

Treatment.—The treatment in nearly all of the fifty cases has been prompt evacuation of the pus by simple incision. The patient is anesthetized, ether being nearly always used. The skin and all instruments are carefully rendered aseptic. The patient is slightly turned on the sound side, and the arm raised and drawn forward. The site of operation has been a little behind and below the angle of the scapula in its present position, usually in the eighth interspace. The presence of pus having been ascertained at the time of operation by the exploring needle, a scalpel is thrust straight through the parietes of the chest along the upper margin of a rib. A

grooved director is insinuated alongside of the scalpel, which is now withdrawn; a curved probe-pointed bistoury is now introduced, and the incision enlarged to about one or one and a half inches. When as much pus as possible has been got out, a large drainage-tube is inserted and a dressing put on.

Out of this whole series of cases in which simple incision was done, the author thinks that only two would have been better drained had a portion of rib been excised; yet these both made a perfectly satisfactory recovery. It is, of course, a very different thing when an empyema has burst of its own accord, and when, in consequence of non-expansion of the lung, a falling in of the chest-wall has occurred, so that the ribs are in actual contact, or nearly so. In such a case excision of one or more ribs is necessary to give egress to any retained pus. In this series there were three cases in which empyemata apparently successfully drained required re-incision. Good results were obtained in each of these three cases by simple re-incision, without excision of a portion of rib.

TABLE OF RESULTS.

	Recovered.	Died.
I. <i>Not operated on</i> —		
Died, Nos. 7, 10.....	...	2
Declined operation, No. 25.....	1	...
II. <i>Aspirated only</i> —		
Further treatment declined.....	1	...
III. <i>Incised</i> —		
A. <i>Empyema cured</i> —		
(1) Lungs clear; no phthisis.....	30	...
(2) Suspicion of phthisis.....	4	...
(3) With phthisis.....	1	...
B. <i>Sinus remaining</i> —		
(1) With phthisis.....	1	...
(2) Without phthisis.....	4	...
C. <i>Death</i> —		
From advanced phthisis.....	...	3
Double empyema.....	...	1
Complicated with hepatic abscess.....	...	1
Anomalous case.....	...	1
	42	8
Total.....	50	

Of those operated on by incision (forty-six in all) six died. A reference to the table shows an obvious reason for this. Of those who recovered perfectly, the shortest duration after operation was three and one-half weeks, and the longest twenty-three weeks. The average duration was seven weeks.

Mechanism of re-expansion of lung.—The author quotes the opinion of Dr. Robertson, who maintains that the cause of re-expansion of the lung is the fact that there is a pad sodden with discharge covering the end of the drainage-tube. He maintains that this acts practically as a valve permitting the

exit of pus by gravitation and the expiratory efforts of cough, but offering an obstacle to the ingress of air. As regards the air already in the pleura, some may be absorbed and some may be driven out through the chest-wall by expiratory efforts, and that thus the lung is brought under the influence of the ordinary inspiratory mechanism. In this explanation of the re-expansion of any lung that may be collapsed the author is quite in agreement with Dr. Robertson. As regards the amount of lung collapsed after incision for empyema, he holds a different view. The author thinks that the functionally active portion of the lung does not collapse when an incision is made into the pleural cavity, and gives these reasons. Auscultation just after incision often reveals vesicular breathing over as extensive an area as before, and sometimes over areas that were formerly dull from the existence of pus. If the greater part of one organ collapsed in cases of incision for empyema, disaster would follow. We know, on the contrary, that relief is, as a rule, obtained. In harmony with this view the author quotes from the observations of Dr. Samuel West, who gives some experiments on what he calls the cohesion of two smooth surfaces. Two portions of stomach-wall stretched on two disks were placed with the peritoneal surfaces against one another. He found that the force required to separate them one from another was greater than the elastic force of the lung. We can thus understand how it is possible to incise an empyema without collapse of the functionally active portion of lung ensuing.

Annandale, Thomas: *Acute Intussusception in a Child; Cured by Operation*. (*Edinburgh Med. Journ.*, March, 1889.)

The author records this case in order to emphasize the importance of early operation in cases of acute intestinal obstruction when other means have failed to relieve the condition. In this case enemata and the introduction of a bougie failed to relieve, although very gentle traction from within, after the abdomen had been opened, was sufficient to release the invagination. The author calls attention in this paper to the additional proof afforded by this case of the value of traction upon intestines from within in certain cases of strangulated hernia, or some other forms of intestinal obstruction. The child, aged three years, had suffered for two days with the following symptoms: Pain in abdomen with vomiting; passage of several ounces of blood per rectum; and upon the left side, towards the lumbar region, an elongated swelling was felt. Examination per rectum discovered a mass on left side that could be pushed up, but would immediately descend. The abdomen was

opened by a central incision about two inches in length. The intussusception was relieved at once by slight traction. Immediately wind was passed freely by the rectum. The child made a perfect recovery.

Owen, Edmund: Excision of a Large Nævus. (*Lancet*, February 9, 1889.)

The nævus, the size and shape of a Tangerine orange, was situated over the right pectoral region of a child two months old. The skin on the surface was red in color, and the blood could be squeezed out on firm pressure. It was removed by excision, being attacked in sections, and the bleeding vessels secured as soon as divided. Very little blood was lost. The edges of the incision were brought together by deep wire sutures. Healing was complete in sixteen days. The author believed that if transfixion and ligature had been employed the infant would have sunk exhausted by pain and suppuration, while the deepest parts of the mass would not have been reached. Electrolysis would have required at least three operations.

In removing a nævus by the scalpel, it is necessary to keep well beyond the nodules of vascular fat which surround the spongy and growing mass. With plenty of catch-forceps the whole tumor can be cleanly removed without hemorrhage.

Duncan, John: Caries of Vertebrae; Paralysis; Operation; Cure. (*Edinburgh Med. Journ.*, March, 1889.)

The illness of the boy, aged eleven years, was attributed to a severe fall two years previously. He began to feel numbness in his legs about one year later. Paraplegia was complete in about sixteen months. When he came under observation there was a marked angular curvature in the mid-dorsal region. The operation consisted in removing the spines and laminae of the fourth, fifth, sixth, and seventh dorsal vertebrae. The membranes were found adhering to the bones by granulative texture. They were easily separated and appeared quite white and smooth. The canal above and below was quite free, and in no way compressed the containing viscus. A plaster-of-Paris jacket was applied. Two days later the patient could move his feet, and sensation had returned to some extent. He improved steadily until at the end of two months he was able to stand, and two weeks later walk some unsupported. The patient is still improving. This case is a further confirmation of the value of Mr. McEwen's suggestion for the relief of paraplegia due to caries of the vertebrae. After discussing the subject the author concludes that the operation is not only feasible but a safe and useful addition to surgical procedure.

Bibliography.

THE second volume of the "Cyclopædia of the Diseases of Children" is before us, with so much more matter than was contained in Volume I., and so many more writers contributing to it, that we are at a loss how to approach it, as it is manifestly impossible to give a review of each article. The volume presents a remarkably handsome appearance, and is richly illustrated with plates and figures. The objection which might have been urged against some of the photographs of Volume I.—that they were not entirely clear—is entirely inapplicable here. In fact, though we have tried to review the work with a critical eye, we have failed to find anything really meriting unfavorable criticism, and have nothing but praise to offer.

Part I. is devoted to Diseases of the Skin. The writers in this department are Hyde, Hardaway, Tuholske, Van Harlingen, Bulkley, Graham, Stelwagon, Pilcher, and Atkinson; a list of names so well known that the value of the contributions is guaranteed. The fact that the articles are by so many different writers has interfered to some extent with the systematic classification of the disorders, although a certain order has been followed. The great frequency of Eczema in children leads us to note with especial interest the article by Van Harlingen regarding it. The author describes the various causes of eczema, expressing his belief that they are both external and internal. He then details the various forms of the disease as found in children. The section on treatment is particularly full. Another article of some length is that of Pilcher on Nævus,—a very thorough discussion of this condition, and especially of the various methods of treatment which have been advised. I. E. Atkinson's article on Syphilitic Skin-Affections is also interesting, as, indeed, are the remaining and, for the most part, shorter papers by the different contributors. Unfortunately, the limits of this review forbid further mention of them.

Part II. is occupied by Constitutional Diseases, and Diseases of Nutrition, opening with a valuable article by Henry Ashby on Scrofulosis. The author thinks it is wise, in the present state of our knowledge, to avoid all reference to morbid anatomy in formulating a definition of scrofulosis, and to use the term only in a clinical sense. He would accordingly call a child strumous "who suffers from inflammations of a peculiar type, especially affecting the skin, mucous membranes, lymphatic system, bones, and joints. The distinctive characters of these inflammations are that they are induced by slight irritation or injury, are very inveterate and slow to heal, and are exceedingly apt to involve the neighboring lymphatic glands. There is a marked tendency to caseation and chronic suppuration." The author considers the etiology carefully, particularly the influence of improper food. He then takes up the relation between

scrofula and tubercle, analyzing the evidence for and against their identity. He appears to be of the opinion that the scrofulous condition is not tubercular, but that the smallest caseous foci in an inflamed gland indicate the presence of tuberculosis; the bacilli having in some way found an entrance into the gland. "It is this tendency for a simple inflammation to become tubercular which distinguishes the scrofulous diathesis." An interesting discussion of the various symptoms of scrofula follows, with a description of the different forms in which it shows itself in the different parts of the body.

Jacobi contributes an article on Tuberculosis in general, which we cannot pass without especial mention. He shows that neither caseous degeneration nor giant-cells are pathognomonic of tuberculosis, but only the specific bacilli; and believes in both congenital predisposition and hereditary transmission. This latter has been denied by some of the most critical pathologists, but the author reports a case in a seven-months foetus which certainly seems to entirely prove its occurrence. He insists on the necessity of the surface on which the bacilli rest being in a morbid condition before it can offer a nidus for them; and expresses himself in accord with the most recent researches by saying that "phthisical patients in the wards of a hospital are uninjurious, as long as no expectoration is permitted anywhere but in a spittoon containing some water." Particularly worthy of note is his description of the symptoms. In speaking of treatment, he again emphasizes the fact that it is only when dry that the sputum becomes dangerous, and urges the greatest care in disposing of it. As bacilli are introduced with the food, and as cows often have tuberculous udders, no child ought to drink milk which has not been thoroughly boiled. The author has no faith in the efficacy of anti-bacillary medicines, and believes only in fortifying the system against the inroads of the disease.

Abner Post gives an exhaustive review of Syphilis in Children, the parental conditions under which we may expect hereditary syphilis to appear in the infant, and the evidences of the disease in the different organs of the body. The discussion of the various symptoms is particularly thorough, and that of treatment, too, is very satisfactory. A separate portion of the paper is allotted to the consideration of the "Late Manifestations of Congenital Syphilis,"—*i.e.*, those seen in childhood and youth; such as the peculiar state of the teeth, the condition of "infantilism" of Fournier, keratitis, periostitis, etc. He thinks the necessity for treatment in these late cases is not fully appreciated.

Forty-one pages are contributed by Thomas Barlow and Judson S. Bury in a masterly article on Rachitis. We note especially the thorough discussion which the skeletal modifications receive. Under nervous disturbances the authors call attention to the relation of infantile tetany to rickets, and give an account of this condition. They explain the morbid anatomy of the disease with great minuteness, and with illustrations showing the development of normal bone and the histology of the bones in rickets. They relate also the experiments performed and the theories held with reference to the cause of the disease, and describe its relation to other disorders; concluding that the proliferation of cartilage with

increased vascularization is pathognomonic of rickets; that we have to deal with an irritative overgrowth of the osteogenetic tissues; and that this, and not a deprivation of lime, is the primary fact of the disease. Finally, that, whatever the irritant causing the overgrowth, it is certainly formed with great ease in infancy, and in many cases in foetal life. The authors believe that foetal rickets is clearly determined by frequent child-bearing and by the continuance of suckling during pregnancy. Since the proper nourishment of the infant is so important as a prophylactic measure, they discuss at considerable length the best methods of artificial feeding, in case the mother's milk fails. As regards the treatment of the disease already established, they share the general belief in the value of cod-liver oil, baths, and frictions.

Barlow alone contributes a short, pithy article on Scurvy, showing how the disease, (1) in infancy and (2) in childhood, agrees with and differs from the adult type. After detailing a number of illustrative cases, he gives a summary of his conclusions concerning the symptoms, following this by a summary of the treatment which he deems advisable.

Bury also gives a very interesting and complete account of Cretinism, including its relation to goitre and to myxœdema. He inquires carefully into the influence of locality, soil, and climate on the development of the disease, and describes the symptoms and pathology of both the endemic and sporadic forms.

The subject of The Urinary Diatheses is treated by the late J. Milner Fothergill in his striking style, this paper being the last written by his able pen. Of oxaluria in children he says little is known, and much the same is true of phosphaturia. The author dwells upon the frequency of lithuria in childhood, quoting Prout, that it is very liable to occur in the children of dyspeptic and gouty individuals, or in those who inherit a tendency to urinary affections. "Lithogenesis," he says, "is reversion" to the type of animals of a lower order. "It is not something added to a healthy child, but something taken away." Again, "Brain-toilers not only upset their own assimilative processes, but they beget children with what Drs. Budd and Murchison have called 'insufficient' liver; who retain the uric-acid formation of early childhood into later days." In discussing further the etiology of the diathesis, he lays still more stress on the influence of struma in its production. So much, indeed, is he impressed with the connection between them, that his paper smacks somewhat of a contribution on the latter condition. He dwells upon the importance of always examining the urine, on the relation of uric acid to nocturnal incontinence of urine and to the occurrence of urinary calculi, on the tendency of lithæmic children to take cold, etc. He finally speaks of the need of promoting oxidation in endeavoring to treat the disease, thus helping the liver to keep up the formation of urea. For this purpose he insists on an abundance of fresh air and on the restriction of the amount of meat ingested. He especially condemns peptonized food, as it finds its way without difficulty into the portal vein, and throws an additional amount of work on the liver. Milk is useful and fat important. As medicines he recommends potash and lithia, while arsenic and calomel are sometimes of value.

Diabetes Mellitus is treated of briefly by George B. Fowler, the author limiting himself for the most part to statistics showing the rarity of the affection in infancy and childhood, and to a review of the different opinions which have been held regarding its pathology. He states that no recoveries from diabetes occurring in children have been reported.

Part III. opens with a section of about ninety pages on Diseases of the Nose. The paper by J. N. Mackenzie, on Nasal Obstruction, gives a very clear account of the causes, nature, and effects of this difficulty, and the relation which it bears to diseases of the ear; the differential diagnosis discussed quite fully. Treatment, of course, consists in removal of the obstruction, which "cannot fail to relieve, even if it fail to cure."

One of the most noteworthy articles of the section is that by E. Carroll Morgan, on Epistaxis. The author reviews the writings of the ancients upon the subject, showing how fully it has been described by them. Under etiology he says that nose-bleed occurs (1) from "hemorrhagic spots;" (2) as a symptom of various intra-nasal diseases; (3) as a symptom of general disease; (4) as a result of vaso-motor influences. Each of these he discusses in turn. Remarks are made on the epistaxis occurring in diphtheria, pertussis, respiratory diseases, hepatic disease, splenic disease, rheumatism, the eruptive fevers, etc.; also on periodical and vicarious epistaxis, and on that seen in masturbation and after surgical procedures. He quotes Sir Thomas Watson's remark on the condition,—that "sometimes it is a remedy, sometimes a warning, sometimes really in itself a disease." Sufficient space is allotted to pathology, symptoms, and treatment. Under the latter he advises strongly against hasty and heroic treatment in uncomplicated spontaneous cases in children, and details the usual simple measures in vogue. Astringent injections or powders he would next employ, reserving plugging, either anterior or posterior, for cases in which other means have failed.

D. Bryson Delavan makes a systematic review of the different varieties of tumors found in the nose, and also gives an interesting account of the various foreign bodies in the nose, and the method of detecting and removing them.

Other articles, all good, are those of F. H. Bosworth on Congenital Syphilis of the Nose, Croupous Rhinitis, and Purulent Rhinitis, W. C. Jarvis on Hypertrophic and Atrophic Rhinitis, Carl Seiler on Acute Coryza, and Alexander W. MacCoy on Reflex Cough.

The section on the Pharynx consists of three excellent articles. The first, by E. F. Ingals, on the Diseases and Injuries of the Pharynx, discusses the different varieties of pharyngitis, including the acute, erysipelatous, acute rheumatic, and membranous forms; those seen in small-pox, measles, and scarlatina; both acute and chronic follicular pharyngitis; and the scrofulous and acute tubercular types. Each one of these is treated concisely and very clearly, a vast amount of unnecessary reading being spared us. Retro-pharyngeal abscess is then taken up, and then some sensory and motor affections of the pharynx briefly considered.

The second article, by Beverley Robinson, on Diseases of the Tonsils, is itself a monograph numbering nearly fifty pages. The author gives a

careful description of the anatomy of the gland and its probable function. Then taking up acute tonsillitis, he makes what seems to us a very satisfactory division of it into (1) acute superficial or erythematous tonsillitis; (2) acute follicular or lacunar tonsillitis; (3) deep or parenchymatous tonsillitis. The disease is rare in infancy, and he has himself never seen an instance of the suppurative form in a child. The author's discussion of the diagnosis is of great interest, especially as regards the distinguishing of diphtheria from lacunar tonsillitis. He attributes most importance to the differences in the appearances of the deposit, and to its disposition in diphtheria to return in its primitive character within twelve hours after having been removed. The constitutional symptoms are also to be borne in mind, but may mislead. He considers it a very valuable sign that in lacunar tonsillitis the membrane is limited to the tonsils themselves, while in diphtheria it is rare not to see patches at the same time on the uvula and the soft palate. The second part of the paper is allotted to chronic enlargement of the tonsils, which is treated of in a similarly thorough manner, particularly that part relating to the therapy of the affection.

The third article is a short but thorough and evidently carefully-prepared paper by Harrison Allen, on Adenoid Growths of the Vault of the Pharynx. The author explains the nature of these structures, and the symptoms by which their presence is made known. He is of the opinion that one of the most serious complications connected with them is the possibility of their inflammation in diphtheria, scarlet fever, and typhoid fever, and of undoubtedly sometimes determining a fatal issue. He believes that the growths should always be removed if large enough to produce the characteristic symptoms; and for this purpose he prefers the unguarded finger, though he describes various instruments which have been used.

The portion of the volume allotted to Diseases of the Larynx opens with an article by Charles E. Sajous on Stenosis of the Larynx. In this he reviews briefly the various causes of the condition, such as œdema of the larynx, spasm, syphilis, diphtheria, phthisis, paralysis of the larynx, etc. Then follow valuable remarks on the means of diagnosing the affection from others attended by dyspnœa and due to stenosis or other disorders of other parts of the respiratory tract.

Following this paper is a review, by Morell Mackenzie, of the subject of Tumors of the Larynx as occurring in children, giving the symptoms which they produce, the nature of the various growths, and their treatment.

W. P. Northrup contributes two articles, on Spasmodic Laryngitis and Pseudo-Membranous Laryngitis, respectively. Under the latter title the author includes both purely local croupous laryngitis and laryngeal diphtheria, as he finds it impossible to separate them in the present state of our knowledge.

The two papers of this section which will probably attract the most attention are those on Intubation and on Tracheotomy. In the first, also by Northrup, the history of intubation is given, with a description and illustrations of the instruments to be employed, and directions for op-

erating. He advises that the operation be performed as soon as the air ceases to enter the posterior inferior lobules of the lungs, as shown by auscultation, on the ground that only harm can result from postponing relief. He regards the operation as comparatively free from shock and from danger, and needing neither anæsthetic nor trained assistant.

In the second paper H. R. Wharton contributes nearly forty pages in an admirable treatise on Tracheotomy. He recommends that the operation be not done too hastily, but that it be postponed as long as the child, in cases of diphtheria, is able to sleep a few hours at intervals, in spite of the manifest obstruction. When, however, the child does not sleep, he thinks nothing is to be gained by delay, as he has never seen such a case recover without operative interference. He believes that tracheotomy done for diphtheritic laryngitis will give at least twenty-six per cent. of recoveries, and quotes statistics in proof of this claim. The surgical anatomy of the neck is next treated of, and the instruments to be used and the method of operation explained with numerous illustrations. The author is decidedly opposed to the use of the fenestrated tracheotomy tube. He also objects to the employment of any anæsthetic, being convinced that he has seen it do much harm. He describes very carefully the after-treatment of cases of tracheotomy, on which he properly lays very great stress, and the nature and treatment of the various complications which may arise during or after the operation. The latter portion of the paper relates to tracheotomy for the removal of foreign bodies, for papillary or cystic growths, injuries, and other abnormal conditions.

The third section of Part III. is a large and very important one on the Diseases of the Lungs.

Francis Minot opens this with a short article on Atelectasis, describing briefly its causes, nature, diagnosis, and treatment; the latter having special reference to the means to be employed in atelectasis of the newly-born.

Two of the succeeding articles are upon a subject so important that they demand special comment. The first is an excellent and thoroughly modern paper, also by Minot, on Croupous Pneumonia. The stand which the author takes is shown at once in his definition, in which he calls the disorder "a specific, infectious" one. Exposure to cold he regards as but a predisposing cause. He gives several instances illustrating the infectious nature of the disease. He believes croupous pneumonia to be one of the most common of the severe disorders of childhood, being occasionally met with in infants at the breast, but being most frequent between the ages of four and seven years. This statement, coming from so good an authority, cannot but be of value to those of us who have been confused by the assertions of some text-books that croupous pneumonia almost never occurs before the age of twelve years. The writer then discusses the pathology of the disease and its symptoms, referring among other things to the frequency with which the right apex is attacked in children, to the rarity of initial chill, to the total anorexia which he believes to be natural, since the stomach is incapable of digesting, and to the frequency with which the physical signs do not appear until late in the disease. He

considers the diagnosis from broncho-pneumonia easy, on the ground that the latter is always "secondary to bronchitis, measles, whooping-cough, and other debilitating affections, is indefinite in its course and duration, involves both lungs, and has no characteristic temperature curve." He agrees with those who consider the prognosis nearly always good. As regards treatment, he says, "Very little medicine is needed for healthy children in uncomplicated cases, and none should be given which is not clearly indicated." He objects to the use of poultices and of aconite, thinks digitalis should be administered with great caution if at all, and deems the insistence upon the ingestion of food useless until the crisis has occurred.

The second article, by F. Gordon Morrill, on Broncho-Pneumonia, helps, with that of Minot, to elucidate the difficult subject of pneumonia in children, and conflicts with it in but few respects. The author prefers this title to the terms "catarrhal" and "lobular" pneumonia, which he would abolish altogether. The disease is very common and fatal in children under five years of age, since, as he believes, the vast majority of deaths attributed to bronchitis are really due to broncho-pneumonia. He considers it, too, the starting-point of a large percentage of cases of pulmonary consumption in children, other authors to the contrary notwithstanding. Age is a main factor in its causation, and the affection is far more common than the croupous form under the age of five years. The author then presents some interesting statistics showing the influence of cold and damp, and of overcrowding and poverty in producing broncho-pneumonia. The prevalence of measles and impaired health from other causes are all important factors, but he does not think it has yet been shown that a specific germ has any etiological influence on it. He discusses the pathology in a careful, exhaustive, and eminently satisfactory manner. The symptoms are treated of in a similar way, attention being called to the irregularity in the mode of onset and in the fever, the indefinite duration, the termination by lysis, etc. There is given also a useful table of differential diagnosis between the symptoms of this disease and of croupous pneumonia. In his remarks on treatment the author expresses himself as opposed to the use of poultices, though in favor of a light cotton jacket. He would also avoid ipecacuanha, except to produce emesis if indicated in the later stages. The use of opiates is contra-indicated, as it removes the cough, which is the child's safeguard against collapse. He objects, too, to the employment of cold water or of quinine to reduce fever, and prefers the chemical antipyretics, a matter in which we most decidedly agree with him. The whole paper is certainly a valuable contribution to our knowledge of the disease.

Morrill has also a good paper on Bronchitis in Children; the section on its treatment—which the author well calls "debatable ground"—being particularly full of useful hints, and containing a large number of formulæ. A sub-section on "Capillary Bronchitis" is written with the object of abolishing the term, "which has become a troublesome and intangible ghost, both in clinical teaching and in medical literature."

Three articles appear from the pen of F. C. Shattuck, on Emphysema, Asthma, and Hay-Fever. No assurance is needed that this author's

work is well done, though lack of space forbids our reviewing them critically. That on Asthma is particularly good.

Jacobi contributes an article on Phthisis in Children, in which he attributes the disease in all cases to the bacillus tuberculosis, as he does also most cases of caseous pneumonia and broncho-pneumonia. He divides pulmonary tuberculosis into three forms: (1) acute miliary tuberculosis of the lungs; (2) acute or subacute caseous pneumonia; (3) chronic phthisis. Caseous pneumonia, he says, takes its rise from broncho-pneumonia in most instances, and recovery, when it does take place, is apt to occur in from ten to fifteen days. The author then describes the pathological anatomy and the symptoms in children. He considers that for a consumptive mother to nurse her child is more dangerous than if she had syphilis. He is not one of the many who "feign a contempt for internal medicines in the treatment of tuberculosis," but describes at length and minutely the application of the drugs which he has found most useful.

E. N. Whittier and H. T. Vickery jointly contribute the article on Pleurisy, calling particular attention to symptomatology, and the points in which the symptoms differ from those of adults. They consider the rational signs of the disease frequently misleading in children, and therefore lay much stress on the physical signs.

A. T. Cabot writes the article on Empyema, including peripleuritic abscess, fractures of the chest-wall, caries of the sternum and ribs, and tumors of the chest; and O. P. Rex is the author of a short paper on Diseases of the Thyroid and Thymus Glands, describing thyroiditis, goitre, and thymic asthma. These, with a valuable statistical article by W. A. Edwards on Affections of the Mediastinum, complete this section of the volume.

Part IV., on Diseases of the Circulatory, Hæmatopoietic, and Glandular Systems, is a most important one, and the contributors to it have evidently been chosen by the editor with appropriate care.

Da Costa opens it with a short article on Functional Disorders of the Heart, there being but little by which to distinguish between the symptoms seen in adults and those in children.

William Osler contributes a *résumé* of twenty-one pages on Congenital Affections of the Heart. He divides his subject into—I. Conditions in which structures normal to the fœtus persist during extra-uterine life. II. True anomalies of development. III. Conditions caused wholly or in part by endocarditis. The numerous subdivisions under these headings are then discussed very fully and with illustrations accompanying the text, the author giving us so many facts and figures in such a short space that to abstract the article here would be simply to quote it in full. His remarks on diagnosis are a valuable aid in this most puzzling subject, whose difficulties he illustrates by the reports of some cases.

Cheadle follows with a paper on Acute and Subacute Endocarditis. He believes the endocarditis of chorea to be entirely of rheumatic origin, as is that arising in relation with erythema and fibrous nodules; and gives statistics to show that the vast majority of cases of endocarditis in children depend on the rheumatic state, though he does not omit reference to

the other causes. He discusses carefully the pathological anatomy of the affection, and then takes up the symptoms, calling attention, among other matters, to the tendency of the disease to run its course insidiously and undiscovered in children, and to its disposition to relapse and recur. Another characteristic of endocarditis in children is anæmia. The author then refers briefly to the varieties of murmurs heard in acute endocarditis, particularly as to whether they are organic or not. The treatment must be largely prophylactic. He is of the opinion that salicylate of sodium should not be given if endocarditis has already arisen, but should be substituted by salicin. Many of the points made in this paper are unavoidably repetitions of the author's statements in his article on rheumatism, in Volume I.

A very brief sub-section treats of Ulcerative Endocarditis.

J. Mitchell Bruce makes a thorough review of Enlargement of the Heart. Dividing his subject into Hypertrophy and Dilatation, and presenting tabular statements of the normal size and weight of the heart at different periods in the child's life, he proceeds to the pathological anatomy and pathology of the disease. He makes a sharp distinction between dilatation from overfilling and dilatation from incomplete emptying; the first occurring as a result of valvular deficiency, and being accompanied by hypertrophy, and itself compensatory; the second being the result of inadequacy of the cardiac walls. Only where the second variety of dilatation comes on can we speak of a destruction of compensation. The author also describes "Primary idiopathic dilatation," occurring independently of valvular disease or hypertrophy. Symptomatology is then considered exhaustively, together with the physical signs, with drawings to show the mutual relation of the cardiac and hepatic dulness, the area of the former, and the position of the apex-beat in the three forms of cardiac enlargement,—*i.e.*, hypertrophy, compensatory hypertrophy with dilatation, dilatation from failure. Under the head of treatment are to be noticed some useful hints regarding the proper amount of exercise and the nature of the out-door sports in which a child with cardiac enlargement may properly indulge.

The same author contributes a short paper on Myocarditis and Cardiac Aneurism.

Every one will look with interest to the article of Sansom on Valvular Diseases of the Heart, the author being such an acknowledged authority on the subject. Opening with a few remarks on the pathological anatomy of valvular imperfection in children, on concurrent affections, and on the condition of the muscular tissue of the heart, he takes up the consideration of the etiology, expressing the opinion that traumatic endocarditis is more common in children than is generally supposed, being due in many cases of chorea to the injury to the delicate endocardium from the violent palpitation consequent upon the terror. In this opinion it will be noticed that he differs from Cheadle. The author then begins the study of "mitral inadequacy," arranging the discussion of it in an admirably clear manner. He believes that imperfect closure of the mitral orifice in a child may be brought about by (*a*) structural alteration of the mitral valve, (*b*) dilatation of the ventricle, (*c*) alteration of the

heart-muscle. He considers that every murmur of mitral regurgitation in a child who manifests even the slightest signs of past or present rheumatism indicates a probable imperfection of the valve. He then discusses carefully—I. Chronic mitral inadequacy the result of rheumatic endocarditis, and, II. Chronic mitral inadequacy the result of non-rheumatic endocarditis; and again asserts his belief in a non-rheumatic origin of mitral disease in very many cases of chorea. The author's method of detailing the treatment is also most convenient, on account of the instructive manner in which the various plans proposed are presented for consideration. Too much of value is told us in this part to warrant injustice being done it here by a necessarily short notice.

The next subject is mitral stenosis, the remarks on which are particularly interesting, as the affection is so generally not understood. Tricuspid inadequacy and aortic valvular disease are the two remaining divisions; but here again we feel that a brief review would simply do injustice.

Sansom's article is without doubt one of the best among the very many excellent contributions to the volume.

Diseases of the Pericardium are treated of by T. M. Rotch, the author confining himself as far as possible to the features distinctive of these diseases in infancy and childhood. He refers to the rarity of *pericarditis sicca* in children, the greater rapidity of formation of a pericardial effusion and the likelihood of its being purulent, and the greater degree of interference of large effusions with the heart's action. As a result of his own observation and some ingenious experiments, he has been led to believe that the dulness of pericardial effusion is much more apt to extend to the right of the sternum in children than in adults. Further, that no matter what the position of the patient or the size of the effusion, the broadest part is always towards the diaphragm. In treating of diagnosis, the author lays stress on the difficulty in distinguishing between pericardial effusion and dilated heart, and reports three cases illustrative of this. In the section on treatment he speaks favorably of paracentesis, and suggests for the point of election the fifth right interspace.

J. Collins Warren gives a short account of Diseases of the Blood-Vessels; omphalitis and aneurism receiving the most attention.

T. D. Dunn, who has already made a special study of Hæmophilia, contributes the article on this subject, which contains a history of the affection and a very complete *résumé* of our knowledge concerning it. He regards it as an essentially hereditary disease, and in this respect to be distinguished from simple hemorrhagic diathesis.

B. A. Watson gives us a very complete contribution on Diseases of the Spleen, and their Operative Treatment. After detailing the anatomy and physiology of the organ, he enumerates its various pathological conditions as found on the post-mortem table, discusses such evidences of splenic disease as become evident during life, and then takes up the study of those disorders demanding operative treatment,—viz., perisplenic phlegmon, suppurative splenitis, gangrene, wounds, tumors, and displacements. Finally, the method of operative procedure is described, and a statistical table of reported splenectomies added.

Samuel Ashhurst closes this department with a paper on Adenitis, in-

dicating thereby the non-malignant enlargement of lymphatic glands occurring in children.

Part V., the last of the volume, is devoted to diseases of the digestive system, only that portion relating to affections of the mouth appearing in this volume.

The first paper is upon the Diseases and Care of the Teeth, by E. T. Darby, than whom no one is better qualified to speak authoritatively on the subject. After giving a very useful table showing the time and order of eruption of the temporary and permanent teeth, he explains the irregularities in number and position, the latter due especially to thumb and lip sucking. The author gives a history of our knowledge of dental caries and the phenomena of the process. He advises the prompt attention to caries even in the temporary teeth. He follows this by a brief account of pulpitis, paracementitis, and alveolar abscess, and closes with advice regarding the care of the teeth, which, he says, should begin in infancy.

Roswell Park treats of the Congenital Defects and Deformities of the Face, Lips, Mouth, Tongue, and Jaws. The article is richly illustrated, and includes a large number of different conditions, but we are unable to attempt a review of it. The author has purposely omitted remarks on Hare-Lip and Cleft Palate, these subjects being taken up by J. Ford Thompson in a separate article, in which the different forms and the methods of operating are explained.

A long article of nearly fifty pages on Diseases of the Mouth appears from the pen of W. W. Allchin. It includes so many different disorders that it is scarcely possible to do more than enumerate them. The author divides the diseases of the mouth into simple or catarrhal stomatitis, parasitic stomatitis, stomatitis accompanied by ulceration, and gangrene. Most of these he discusses briefly, but very thoroughly, making thrush the synonyme of parasitic stomatitis, and including under stomatitis with ulceration the forms "simple ulceration," "follicular stomatitis," "membranous stomatitis," and "ulcerative stomatitis." Aphthæ he makes a synonyme of follicular stomatitis, regretting the confusion which has arisen from the application of the term by some to thrush. Cancrum oris receives particular attention, and is accompanied by illustrations of the bodies found by Sansom in the blood, and of the bacillus noma. The sharp differences brought out by the author between the different forms of stomatitis cannot fail to be very instructive to his readers. The remainder of the article is occupied by remarks on suppurative inflammation of the gums, symptomatic affections of the mouth, diseases of the tongue, ranula, and dermoid cysts of the mouth.

The last article of the volume is on the Injuries and Diseases of the Jaws, and their treatment, by J. Ewing Mears, who has paid particular attention to this subject. In order he writes of fractures, dislocations, inflammatory affections, diseases of the antrum, cystic diseases, tumors, and closure of the jaws. His remarks on the treatment of the latter condition are of especial value.

J. P. C. G.

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BALTIMORE, MD., SEPTEMBER 21, 1889.

September 20, 1889.—Morning Session.

THE President, A. Jacobi, M.D., of New York, called the meeting to order at 10 o'clock, in the library of the Surgeon-General's office, Washington, D. C.

The following members were present :

S. S. Adams, Washington ; W. D. Booker, Baltimore ; Dillon Brown, New York ; S. C. Busey, Washington ; A. Caillé, W. L. Carr, New York ; Charles Warrington Earle, Chicago ; J. Henry Fruitnight, L. Emmett Holt, Francis Huber, A. Jacobi, New York ; J. M. Keating, Philadelphia ; Henry Koplik, New York ; T. S. Latimer, Baltimore ; A. V. Meigs, Philadelphia ; W. P. Northrup, J. O'Dwyer, New York ; William Osler, Baltimore ; William Pepper, Philadelphia ; C. P. Putnam, Boston ; A. Seibert, New York ; William Perry Watson, Jersey City ; J. E. Winters, New York ; and John A. Jeffries, Boston, and H. N. Vineberg, New York, by invitation.

Dr. A. Jacobi then delivered his annual address on "The Relations of Pediatrics to General Medicine."

The reports—verbal—of the Secretary and Treasurer were then made.

On motion, it was decided to hold a session this evening in a parlor of the Arlington Hotel.

On motion, it was decided to accept the invitation of the Superintendent of the Johns Hopkins Hospital to hold a regular session there to-morrow.

Dr. Francis Huber then read a paper on "Two Cases of Double Empyema," which was discussed by Drs. Caillé, Koplik, Pepper, Osler, Putnam, Carr, Holt, Fruitnight, Vineberg, and Meigs.

Dr. Charles Warrington Earle then read a paper on "Subcutaneous Emphysema in Children," which was discussed by Drs. Huber, Fruitnight, Jacobi, and Carr.

Dr. A. Caillé then read a "Report of a Case of Membranous Croup (laryngo-tracheitis) in a Girl Twelve Years Old: Tracheotomy: Recovery," which was discussed by Drs. Brown, O'Dwyer, and Jacobi.

Dr. Caillé also read a paper on "Personal Prophylaxis in Diphtheria," which was discussed by Drs. Fruitnight and Earle.

Dr. Charles Warrington Earle then read a paper on "The Necessity of Prolonged Rest after some Attacks of Diphtheria."

The Society then adjourned until 3 P.M.

Afternoon Session.

Society called to order by President Jacobi at 3 o'clock.

Dr. J. Henry Fruitnight then read a paper on "The Treatment of Scarlet Fever and its Complications."

Dr. L. Emmett Holt then made a report of "A Case of Congenital Malformation of the Heart, simulating Dextro-Cardia," with presentation of specimen, which was discussed by Dr. Northrup.

Dr. A. Caillé also presented a specimen, "Janiceps Asymmetros."

Dr. J. O'Dwyer then read a paper on "The Apparent Physical Contraindication involved in the Re-inflation of a Collapsed Lung while an Opening remains in the Pleural Sac,"

which was discussed by Drs. Northrup, Jacobi, Carr, and Jeffries.

Dr. Dillon Brown then read a paper on "Noisy Respiration," which was discussed by Drs. Fruitnight, Caillé, Huber, and Carr.

Dr. Henry Koplik then read a paper on "Tuberculosis of the Testis in Childhood."

Dr. Francis Huber then read a paper on "Acute Suppurative Peritonitis following Vulvo-Vaginal Catarrh," which was discussed by Drs. Caillé and Koplik.

Dr. W. P. Northrup then read a paper on "Sclerema Neonatorum : Report of a Case," which was discussed by Drs. Huber, Koplik, Holt, and Jacobi.

On motion, a vote of thanks was given to Dr. John S. Billings and the Surgeon-General U.S.A., for their kindness in providing a room for the meetings of the Society.

The Society then adjourned until 8 P.M.

Evening Session.

The Society was called to order at 8 o'clock by President Jacobi, in a parlor of the Arlington Hotel.

Dr. A. V. Meigs then read a paper on "The Artificial Feeding of Infants," which was discussed by Drs. Holt, Winters, Keating, Caillé, Booker, Adams, and Fruitnight.

Dr. John A. Jeffries then read a paper (by invitation) on "A Contribution to the Summer Diarrhoeas of Infancy," which was discussed by Drs. Northrup and Booker.

Dr. J. O'Dwyer then read a paper on "A Case of Diaphragmatic Hernia, with Operation," which was discussed by Drs. Northrup, Holt, and Vineberg.

Dr. A. Caillé then read a paper on "Prolapsus Recti due to a Large Stone in the Bladder of a Girl Three Years Old," which was discussed by Dr. Fruitnight.

On motion, it was decided to go to Baltimore on the nine o'clock train to-morrow morning.

On motion, it was ordered that all the papers read, and the discussions thereon, be furnished to and published exclusively in the ARCHIVES OF PEDIATRICS, the publishers of which in

return, to furnish the Society with five hundred reprint copies of the same.

On motion, a vote of thanks was extended to Dr. Jeffries for coming to the meeting and reading his valuable paper.

The resignation of Dr. Simon Baruch, of New York, was presented and accepted.

On motion, the Society adjourned until to-morrow morning.

September 21. — Session held in Johns Hopkins Hospital, Baltimore, Md.

The Society was called to order at 10.30 A.M. by President Jacobi.

Dr. H. N. Vineberg then read a paper (by invitation) on "Some Practical Points in the Diagnosis and Treatment of Malaria in Children," which was discussed by Drs. Earle, Holt, Fruitnight, Jeffries, Carr, Huber, Seibert, Jacobi, Keating, Watson, Caillé, and Latimer.

On report of the Council, the following officers were elected for the ensuing year:

President.—J. Lewis Smith, M.D., New York.

First Vice-President.—A. V. Meigs, M.D., Philadelphia.

Second Vice-President.—F. Forchheimer, M.D., Cincinnati.

Secretary.—W. D. Booker, M.D., Baltimore.

Recorder.—William Perry Watson, M.D., Jersey City.

Treasurer.—Charles Warrington Earle, M.D., Chicago.

COUNCIL.

T. S. Latimer, M.D., Baltimore; J. M. Keating, M.D., Philadelphia; I. N. Love, M.D., St. Louis; S. C. Busey, M.D., Washington; C. P. Putnam, M.D., Boston; A. D. Blackader, M.D., Montreal; L. Emmett Holt, M.D., New York.

On report of the Council, the following gentlemen were elected members of the Society:

John A. Jeffries, M.D., Boston; Henry Jackson, M.D., Boston; Charles W. Townsend, M.D., Boston; H. Lafleur, M.D., Baltimore.

The Council also recommended the following amendments to the Constitution: Article XIV., Section 3, "Should any

paper be too long to be read in twenty minutes, the writer will be expected to prepare an abstract which can be read within that time." Article XIV., Section 5, to insert after the word Council, "six weeks before the annual meeting." Article X., insert at end, "All papers presented shall become the property of the Society."

Dr. Holt offered, as an amendment to Article V., the following: "Each member shall pay an annual fee, the amount of which shall be decided upon at each annual meeting."

The proposals for membership were referred to the Council.

Dr. T. S. Latimer then read a paper (with presentation of case) on "Cases of Spastic Paraplegia."

Dr. R. H. Thomas then presented, for Dr. Osler, specimens of Cerebral Sclerosis in children.

Dr. W. D. Booker then read a paper on "A Study of some of the Bacteria found in the Dejecta of Infants affected with Summer Diarrhœa." (Second communication.)

Dr. A. Seibert then read a paper on "Two Years of Experience in the Mechanical Treatment of Gastro-Intestinal Disorders in Infants," which was discussed by Drs. Koplik, Keating, Booker, Vineberg, and Jacobi.

The following papers were read by title and referred for publication: "Two Cases of Nystagmus associated with Choreic Movements of the Head in Rhachitic Babies," by A. Caillé, M.D.; "Aneurism in Early Life," by A. Jacobi, M.D.; "Carpopedal Contractions,—one Manifestation of Tetany," by Chas. Warrington Earle, M.D.; "Notes on a Case of Ataxia in a Child of Two Years," by A. D. Blackader, M.D.; "Two Cases of Biliary Cirrhosis in Children," by M. P. Hatfield, M.D.; "Recent Improvements in Infant Feeding," by J. Lewis Smith, M.D.

On motion, a vote of thanks was given to President Jacobi for his untiring efforts in behalf of the successful meeting now about to close.

President Jacobi presented the thanks of the Society to the authorities of Johns Hopkins Hospital for courtesies shown the Society.

On motion, the Society adjourned, subject to the call of the Council.

THE PRESIDENT'S ADDRESS.

THE RELATIONS OF PEDIATRICS TO GENERAL MEDICINE.

BY A. JACOBI, M.D.,

New York.

GENTLEMEN,—Progress and success, in order to be complete and unmistakable, require centralization of means and co-operation of men. The pioneer in his seclusion, the hard-working settler, the thin population of a county, the joining of the disseminated parts to form a state, and the amalgamation resulting in the establishment of a powerful and world-moving nationality, exhibit an example of the geometrical increase of strength resulting from the combination of forces. The isolated labors of the greatest men in the history of science never accomplished anything beyond a spasmodic and stationary advance. Twenty centuries in succession lived on the unchanged teachings of Hippocrates, Aristotle, and Galen.

The establishment of institutions of learning in modern times, mainly since the fifteenth and sixteenth centuries, multiplied the names of men, though none reached those three ancients, who, in contact with others equally disposed, labored successfully in the interest of science. Paracelsus, Descartes, Sydenham, Boerhaave, Van Swieten, Haller, Peter Frank, and Bichat promoted science, partly through contest, partly through co-operation with fellow-laborers. The multiplication of institutions, the similarity of aims and ambitions, the establishment of faculties and learned societies, accomplished, through the co-operation and friction thus created, a progress more pronounced in decades than formerly in centuries.

The best results, however, were obtained by the voluntary associations of scientific men all over the world. In this century, the German Association of Naturalists and Physicians, the British and the American Medical Associations, the numerous local and provincial societies, and last, though by far not least, the American Congress of Physicians and Surgeons, with its many special associations and societies, have not only

encouraged scientific originality but raised the average standard of the profession at large.

That is what the isolated labors of individual men never attained. From this point of view I hailed the proposal to form an American Pediatric Society with satisfaction and delight. Thirty years ago I contemplated the formation of a section for the purpose of studying the diseases of children in the New York Academy of Medicine, and failed. These nine years the American Medical Association had its section on diseases of children, the first meeting of which took place under the presidency of S. C. Busey, and the New York Academy of Medicine has a flourishing pediatric section under J. L. Smith. To-day this national association has convened without difficulties and with all the promises of speedy success. The spontaneity of its origin is a guarantee of vitality and prosperity. My failure at that early time did not signify that no attention had been paid in the United States to the physiology and pathology of infancy and childhood. It simply meant that the relations of pediatrics to practice and to the other departments of medicine were not yet duly appreciated. In most countries in Europe it was the same. In America the names of Dewees, Stewart, Eberle, Condie, Charles D. Meigs, John Forsyth Meigs, and W. V. Keating are still holding an honorable place in the history of pediatrics. But their labors were individual and isolated. Though their teachings were appreciated, the profession at large was not sufficiently advanced to look upon the close and special study of the diseases of children as a necessity from the twofold point of view under which I began early to consider it. I was ever of opinion that not only had special occupation with infant pathology and therapeutics its reward in itself, but its connection with every other special doctrine aided and fostered the intimate and profound knowledge of other branches of medical science and art. Thus the future connection of this society with the Triennial Congress of American Physicians and Surgeons will prove a mutual benefit to all parties concerned.

In an introductory to the "*Cyclopædia of the Diseases of Children*," edited by John M. Keating, I have tried to establish the claims of pediatrics to be considered a specialty. Not

that it is one in the common acceptation of the term. It does not deal with a special organ, but with the entire organism at the very period which presents the most interesting features to the student of biology and medicine. Infancy and childhood are the links between conception and death, between the foetus and the adult. The latter has attained a certain degree of invariability. His physiological labor is reproduction; that of the young is both reproduction and growth. As the history of a people is not complete with the narration of its condition when established on a solid constitutional and economic basis, so is that of man, whether healthy or diseased, not limited to one period. Indeed, the most interesting time, and the one most difficult to understand, is that in which persistent development, increase, solidification, and improvement are taking place.

I have tried to prove that "pediatrics does not deal with miniature men and women, with reduced doses and the same class of diseases in smaller bodies, but that it has its own independent range and horizon, and gives as much to general medicine as it has received from it." My reasoning was that there is scarcely a tissue or an organ which behaves exactly alike in the different periods of life. I tried to prove that assertion by a cursory consideration of the osseous tissue, the nervous system, the digestive organs, and the blood and the system of circulation, and the requirements of general therapeutics in the young. To these expositions I added a few remarks on the peculiar character of the diseases of infancy and childhood. There are anomalies and diseases which are encountered in the infant and child only. There are those which are mostly found in children, or with a symptomatology and course peculiar to them; and those, finally, which affect both the young and old, with such varieties, however, both in symptoms and course, as depend on the size or nature of the inflicted organ or organism, or the difference in the degree of its irritability.

The relations of pediatrics to the several special parts of the extensive field of scientific medicine are very various. Internal medicine owes many of its best results to the observations made on infants and children. It is in them that

constitutional and developmental diseases are either best or exclusively studied. In this connection I remind you only of scrofula, rhachitis, anæmia, and chlorosis. Infectious diseases, such as diphtheria, scarlatina, measles, varicella, parotitis, pertussis, and tuberculosis, mainly of the bones and joints, of the glands and peritoneum, are mostly encountered in infancy and childhood. Neoplasms are not only frequent in young children,—more than forty cases of sarcoma of the foetal or infant kidney alone were collected by me for the International Congress of Copenhagen five years ago,—but rouse the most intense interest, from the fact that Cohnheim tried to trace every neoplasm of later life to its embryonic or foetal origin. All the actual or alleged disorders belonging to dentition, most forms of stomatitis, amygdalitis, and pharyngitis, including latero- and retro-pharyngeal abscess, many of the most frequent and important diseases of the nose with their consequences, and of the larynx, are met with in the young. It is in them that catarrhal pneumonia has been studied principally, atelectasis almost exclusively. Some of the forms of diarrhœa, and still more of constipation, are exclusively the property of young children. It is in them, also, that internal medicine has learned the pathology of muscular pseudo-hypertrophy; from them, finally, that it has improved and increased diagnostic resources, for nobody can study Finlayson's contribution to the first volume of the *Cyclopædia* without finding many of them greatly depending on certain peculiarities of the several infant organs.

The surgery of infancy and childhood is so peculiar, its indications so varying, the number of cases so large, and some of the operative procedures so exclusively or almost exclusively adapted to, or necessitated by, surgical diseases of the young, that the transactions of surgical societies and journals are largely filled with discussions on subjects belonging to the sphere of pediatrics. I remind you of the frequent occurrence of congenital malformations requiring interference; those of the anus and rectum, hare-lip and fissured palate, spina bifida and hydrocephalus. The several forms of bone-disease, in the vertebræ, the hip- and ankle-joints, which require resection or scooping, demand special knowledge and skill, because of the

dignity of the intermediate cartilage. Osteotomy is more frequently performed in the rickety young than at any other age or in any other disease. Tubercular swelling of the lymph-bodies occurs more frequently in the young than in advanced years. The majority of tenotomies are performed on children. Tracheotomy and intubation belong pre-eminently to early age. The largest number of tracheotomies performed by an individual operator is furnished by an author who does not claim any merit as a professional surgeon. The operation for pyothorax is mostly required in the young, and taxes the experience and prognostic judgment of the medical man to an unusual degree, because of the variety of indications depending upon the amount of flexibility of the ribs and the extent of complications. Invagination is mainly seen in the very young. Twenty-five per cent. of all the cases occur under one year; fifty-three under ten. Two-thirds of those under a year are between the fourth and sixth months. Perityphlitis, though rare in infants, is not at all infrequent in children of seven or eight years and upward; and both it and intussusception require often surgical interference. Indeed, so common are the claims on surgical skill in the practice among infants and children, that among the most instructive and interesting surgical treatises are those which discuss the surgery of childhood alone. I will only recall the special works of Guersant, Forster, Bryant, Giraldès, Holmes, St. Germain, and the fifteen hundred pages written by a dozen different authors in C. Gerhardt's "*Manual of the Diseases of Children.*" It is a good move on the part of the editors of the new treatise of Henry Ashby and G. A. Wright that one of the authors is an experienced operative surgeon.

The connection of pediatrics with neurology is very intimate indeed. Many of the most interesting neuro-physiological data have been secured by our special colleagues. Thus, Soltmann's researches prove that in the new-born the inhibitory centres of the cerebral cortex are almost not formed at all, and that the motory and sensitive irritability increases rapidly about the fifth and sixth months. This is the time at which reflex excitability is very great. It has also been found that the inhibitory function of the cardiac nerves is but feeble in the very

young. The contraction under the influence of the electrical current resembles very much that which is observed in the fatigued animal, and the peripherous nerves exhibit a slight excitability only. Many other observations can be made on the infant only,—thus, for instance, those concerning the first awakening of perception. On the first or second day of life hearing is active; sight sufficiently developed to be affected by light and darkness; taste and smell exist, but are feeble, and the sense of touch is mainly demonstrable on the lips. The perception of pain is but slightly developed.

Many such special contributions to the physiology of the nervous system gathered in the young could be introduced here. I can omit that in the presence of those who know; but refer to the special works of Kussmaul, G. Darwin, and Preyer, which treat of the psychology of the infant, and to the general treatises on the physiology of the young by Alex, Vierordt, and Victorio Massini.

Neuropathology also owes a great many results to the observations made on infants and children. Disorders of the nervous system are very common in the young. Of all the deaths resulting from diseases of the nervous system, eighty-seven per cent. take place during the first five years of life. Their frequency is best understood by the consideration of their many causes. Many are inherited or acquired during foetal life. Others are due to the insufficiency of the protection afforded to the brain. Thus it is that any trauma, the pressure of a narrow pelvis or the forceps, a fall which in the very young produces rather a general disorder than a local lesion, leads to serious consequences. The neighboring organs, such as the ear or the scalp, are liable to affect the brain; for that reason otitis and impetigo are dangerous processes. The very anatomical development, the increasing separation of the two cerebral substances, and the incompetency of the centres of inhibition and those of co-ordination, lead to morbid processes. Anomalies of the bones, such as rhachitic softening and, still more, premature ossification, interfere with the cerebral development or lead directly to serious or incurable alterations. The incomplete structure of the blood-vessels is another frequent cause of disease from mere temporary congestion to

serous effusions or to extravasations. Thus we have an explanation of many of the facts unaccountable to the superficial observer only. The number of neuropathies not directly fatal is excessive in the young. Convulsions of every description, eclampsia, chorea, tetany, epilepsy, poliomyelitis, Friedreich's ataxia, gather their most copious harvest among infants and children. And again, it is these on whom most of our knowledge of cerebro-spinal meningitis and cerebral meningitis has been obtained.

Neurology's sister, psychology, is indebted for much of its wealth to the study of the intellectual life of infancy and childhood. It is sufficient to refer again to the valuable and influential researches of Kussmaul, the younger Darwin, and W. Preyer. Psychiatry also has learned from the mental aberrations occurring at an early age, the more so as many of the causes of mental disease in later life must be traced back to embryological data and the morbid changes of infancy. Asphyxia of the newly-born, with its resulting effusion, extravasations, or thromboses, is a frequent cause of life-long epilepsy, stupidity, or idiocy. Diseases affecting the brain at an early period preclude the formation of ideas. The absence of inhibitory and psychomotor centres in the newly-born animal precludes the equilibrium required for a normal mental organization. The disposition to psychical disturbance resulting from individual constitution, the influences of heredity, and congenital neurasthenia can be studied at the very earliest age. The symptoms of fully-developed or imminent or future mental disease are more readily studied in the young than at more advanced age, for in the young the slightest deviations will tell. Such symptoms, which are easily recognized, are waywardness and restlessness, grimacing, convulsive twitching and convulsibility, abnormal sleep, retardation of growth, and excessive masturbation. Wherever they are found to be not the direct results of easily appreciated causes,—as, for instance, what I have called local chorea depending on chronic naso-pharyngeal catarrh,—psychical disturbances may well be feared. They are more frequent than the reports of lunatic asylums would appear to prove. For there are but few insane children in the institutions, for obvious reasons.

It is only those cases which become absolutely unmanageable at home which are intrusted to an asylum. Thus it is that we can obtain more accurate statistics of idiocy than of dementia of early years. The anatomical symptoms of degeneration, leading sooner or later to mental disorders, are studied to best advantage mostly in infants and children. Of epilepsy, which mostly starts early, it is not necessary to speak here. I shall only allude to the deformities of the cranium due to general or local premature ossification of the cranial bones and fontanel, to the peculiarities of the position of the teeth and ears, the retracted root of the nose, the asymmetry of the head and face, due either to unilateral atrophy or hypertrophy, and the shortened base of the skull. Besides, there is the excessive number of cerebral diseases manifest at a time when the increasing growth of the organs continues to add to the acquired lesions; also trauma and insolation. Finally, the impressibility of the young is such that the causes of mental disturbance in every age—chorea, hysteria, epilepsy, anomalies of the ears, nose, and heart, the presence of helminthes, the paroxysms of malaria, the anatomical results of typhoid fever, rheumatism, erysipelas, and pertussis, and the nutritive disorders resulting from anæmia, chlorosis, and alcohol—have very much more serious results when occurring at an early age. There are some causes leading to mental disturbances which are certainly more common in the young,—viz., imitation, fear, fright, masturbation, and the protracted mistakes constantly made in regard to training and education. The overworked brains of our school-children have been complained of in this connection as early as 1804 by Peter Frank, and will yet form the subject of a few more remarks.

The history of the embryo and foetus finds its legitimate termination in that of the infant and child. Thus embryology, teratology, and pedology, with pediatrics, are but chapters of the same book. The scientific consideration of any one of them is impossible without that of the others. The theories of heredity and consanguinity refer equally to all. The most important changes and diseases met with in the young human being cannot be studied without the knowledge of its previous history, and the intelligent appreciation of em-

bryology cannot be attained without the exact knowledge of its final outcome. Excessive or defective growth, arrest of development, and foetal inflammation are the heads under which a large number of anomalies of the infant can be subsumed. The frequent occurrence of carcinoma, sarcoma, and lipoma in the young favors Cohnheim's theory, according to which those neoplasms owe their origin to the persistence of embryonic tissue. Abnormally inverted circulation explains the acardiac monstrosity; deficiency of building material accounts for the absence in many cases of limbs or parts of limbs. The laws of duplication, including intrafetation, are now well understood, and the gigantic growth of limbs or parts of limbs, akromegaly, and macroglossia, are as important in the life of the born as they are interesting from the point of view of embryological development.

Many symptoms of rhachitis, syphilis, and hæmophilia cannot be understood except in their embryological connection. The same is valid in regard to congenitally dislocated and horseshoe kidney, and transposition of the viscera. Insufficient closure of embryonic fissures explains encephalocele, porencephaly, spina bifida, bifid uvula and epiglottis, split palate, lips, and cheeks, pharyngeal fistulæ, hernia, and the communications between the intestinal tract and the uro-genital organs, and the persistency and patency of the urachus.

Inflammatory processes give rise to spontaneous amputations, the adhesions of the placenta to the head, to the most severe forms of obstructions and defects in the intestine, to the stenosis of the pulmonary artery, the aorta, and the atrio-ventricular orifice.

I must not, however, multiply examples of the intimate correlation between embryology and the malformations and diseases of the child. These few instances, I believe, will suffice to show to what extent the most exact and special study of the anatomy, physiology, and pathology of the child is a connecting link between, and the safest foundation of, a number of the most important branches of medical research. Indeed, if all the teaching obtained from pedology and pediatrics could be disjointed from those branches, these latter would be stripped of their best material. Though the history of pedi-

iatrics is but a brief one, it can safely be stated that those specialties have been to a great part feeding on and been built up by the observations and investigations of men specially interested in the diseases of children. You will find, when you look over the programmes of the nine associations which now form the American Congress year after year, that topics which in future will be the legitimate province of the American Pediatric Society, have attracted much of their attention.

From the first hour of life the infant requires special study. Its diet has been a source of ever-watchful research on the part of many of the best minds. In modern times, Zweifel, Korowin, Biedert, Bouchard,—not to mention A. V. Meigs and Rotch among us,—have deserved well of the subject. Not only diet, however, and individual hygiene have been studied on the child; the most vital questions of public hygiene are also connected with pediatrics most intimately. Besides such as every thinking man is deeply concerned in, it is mainly two topics that attract the attention of those who take an interest in children. I allude to the school and to constitutional diseases. My remarks to-day can be but fragmentary; still, I must not, both in the interest of our science and human society, omit to emphasize the fact that it still appears as if our schools were establishments organized to produce near-sightedness, scoliosis, anæmia, and both physical and intellectual exhaustion. Contrary to the treatment a colt receives at the hands of its owner, human society, or the state, permits or directs that the powers of a child should be rendered unfit for its future functions, physical, mental, and moral, for these three are indelibly interwoven. It requires physical and mental education to fertilize the soil for the evolution of morals. Thus the physician, and particularly he who makes pediatrics his special study, is a pedagogue by profession. The question of school-house building and school-room furniture, the structure of bench and table, the paper and type in the books, the number of school hours for the average child and the individual pupil, the number and length of recesses, the hours and duration of intervening meals, the alternation of mental and physical training, the age at which the average and the individual child should be first sent, have been too

long decided by school-boards consisting of coal-merchants, carpenters, cheap printers, and undertaught or overaged school-mistresses, not, however, of physicians. The health and vigor of the American child in early years seems, according to Bowditch, superior to those of the European. Why is the youth and maiden, particularly the latter, so inferior? Why is it that anæmia and neuroses eat the marrow of the land, and undermine the future of the country by degenerating both the workers and thinkers of the community, and the future mothers? If there is a country in the world with a great destiny and a grave responsibility, it is ours. Its self-assumed destiny is to raise humanitarian and social development to a higher plane by amalgamating, humanizing, and civilizing the scum of all the inferior races and nationalities which are congregating under the folds of our flag. Unless the education and training of the young is carried on according to the principles of a sound and scientific physical and mental hygiene, neither the aim of our political institutions will ever be reached nor the United States fulfil its true manifest destiny. That manifest destiny is not so much the political one of excluding Europeans from our continent,—North or South,—for indeed the participation of European civilization in the gradual work of removing barbarism ought to be very welcome,—but of raising the standard of physical and mental health to possible perfection, and thereby contributing to the welfare and happiness of the people.

Another subject in which, for the same reasons, pedology and pediatrics are profoundly interested is that referring to constitutional and infectious diseases. Most of them belong to early life, and therefore interest you in this society. The vast majority of them can be avoided, mortality greatly diminished, and ill-health resulting therefrom prevented. Ninety-nine cases out of every hundred of rhachitis need not exist. Before we were overrun with the poverty-stricken population of Europe, rhachitis was hardly known among us. Unless the social position of the many be improved and the laws of hygiene understood and obeyed, it will increase until we shall be at a level with Ireland, Switzerland, and Northern Italy. Where the prevention of syphilis lies, or ought to lie, we fully

know. How we could avoid dysentery and typhoid, the number of which increases with the size of tenements, the insufficiency of sewers, with the number of large summer hotels, and defective drainage, we thoroughly appreciate. Scarletina, morbilli, diphtheria, whooping-cough, need not destroy or maim hundreds of thousands if contagion were avoided; and, unless that be done, mankind, state, town, have not performed the most rudimentary function of their existence. After all, we need not boast of our civilization, which indeed requires healing and mending both from a social and medical aspect.

If we would but concentrate our means on fighting preventable disease and death as they concentrate them in Europe for the purpose of preparing for, and carrying on, wars! If we did, we should save as many hundred thousands as they seek to destroy. If, besides, but every physician knew and appreciated his duty and his honorable vocation, which consists in preventing and curing disease, and spending his best efforts in ameliorating human existence! What, then, shall we say of those of our brethren who do not feel it below their dignity to study electricity, or make believe they do, for the avowed purpose of supplanting the hangman?

Questions of public hygiene and medicine are both professional and social. Thus, every physician is by destiny a "political being" in the sense in which the ancients defined the term,—viz., a citizen of a commonwealth, with many rights and great responsibilities. The latter grow with increased power, both physical and intellectual. The scientific attainments of the physician and his appreciation of the source of evil enable him to strike at its root by advising aid and remedies. Such increase of knowledge as the combined efforts of the members of the American Pediatric Society can result in from year to year, such interest as it can raise in its own labors, such impetus as it can give to the profession at large in the direction of special research, such power as it can exert on the instruction in pediatrics of students in the medical schools, such influence as it may have among the wealthy public with a view to establish and endow special hospitals for infants and children, while proving beneficial to all branches of medicine, will be a lasting blessing to the community.

DOUBLE EMPYEMA.

BY FRANCIS HUBER, M.D.,

New York.

BENNY S., thirteen years and eight months old, fell into an excavation eighteen feet deep on January 4, 1889. He was taken out unconscious and carried to an adjoining store, where he was thoroughly drenched with water applied to restore him to his senses. There were no evidences of injury to the head, nor were any of his ribs fractured. In a short time he was taken home, and a few hours later he was seized with a chill, with intense pains in the chest, fever, and cough with a bloody sputum. No history of vomiting of blood. On the third day of his illness he came under my observation, and the diagnosis of double pleuro-pneumonia was made, the percussion note being absolutely flat on the right side. A careful examination could not be made on account of the weak heart.

His condition growing worse, Professor A. Jacobi was requested to see him in consultation on the fifth day of the illness (January 9). We found him in such a precarious condition that it was not considered advisable to allow him to get up, in order to make a careful examination of his chest. Respiration 60, pulse 150 and very weak, temperature $104\frac{1}{2}$ (rectal). The diagnosis of double pleuro-pneumonia was confirmed, and an extremely grave prognosis given. In view of the extensive pulmonary oedema present anteriorly, it was not thought probable that he would live longer than twenty-four hours. Free stimulation was ordered, half an ounce of brandy being given every half-hour, one minim of fluid extract of digitalis, with three grains of camphor, hourly, and carbonate of ammonium every two hours.

Morphia was administered hypodermically once or twice daily in sufficient doses to quiet the pain and allay the restlessness present. His pulse continued weak and his general condition grave. The improvement was slow, and nearly a fortnight elapsed before I ventured to allow him to sit up in

order to make a careful examination of the posterior portion of his chest. The physical examination now revealed fluid, and an exploratory puncture, pus. Tonics and free stimulation continued.

January 31 (twenty-seventh day of illness), assisted by Dr. H. M. Silver, the right pleural cavity was aspirated and more than a pint of pus drawn off, the further flow being prevented by the occlusion of the canula with lymph.

February 2.—Assisted by Dr. H. M. Silver, the left pleural cavity was opened posteriorly below the angle of the scapula and two large drainage-tubes were inserted. Large quantities of pus escaped; no broken-down clots discovered, or any evidence of an old hemorrhage into the pleural cavity. The pleura was now washed out with hot water, large lymph-masses escaping with the pus. Iodoform with bichloride gauze and borated cotton-dressing applied. The general condition contraindicated any extended operation, as the resection of one or more ribs; it was not even considered safe to employ an anæsthetic.

February 6, four days later, assisted by Drs. H. M. and L. M. Silver, the right pleural cavity was incised and drained. A large amount of pus flowed out and masses of fibrin came away. A number of these were three to four inches long and nearly three-fourths of an inch in thickness, and were readily removed with dressing-forceps. The quantity of pus which escaped from the two sides was so considerable that it was a matter of surprise that respiration was at all possible. No anæsthetic, local or general, was used. The two cavities were syringed daily with hot water and dressed antiseptically. For some time the urine contained considerable albumen, due no doubt to the interference or disturbance of the general circulation by the large effusions in both pleuræ. About the middle of the second week after the openings were made, the father was taught how to make the injections and apply the proper dressings. In the mean time, a large bed-sore developed, and added to the discomfort of the patient. Though the surroundings were poor, the improvement in his general condition progressed rapidly after the operations, and about the middle of March both tubes were dispensed with,—that is, in less than

two and a half months from the commencement of his illness, and about five weeks from the time the incisions were made. The patient has been walking about for several weeks. About the second week in April even the sinuses had closed completely. The bed-sore over the sacrum, nearly four inches across, also improved rapidly and soon healed.

April 17.—Pulmonary expansion complete; no retraction of the chest-walls; breathing distinct over both lungs. No dulness. General condition excellent. Appetite good.

Through the courtesy of Dr. Neufeld I am enabled to present a second case.

Nathan W., five and a half years old, fell from the seat of a wagon. He was senseless for a short time, but soon came to, and played around for several hours before going home. Now began to complain of pain in his head; vomited once; soon became feverish and somewhat delirious. The delirium was mild in character, and was present occasionally for a week. The fever, 104° – 105° , continued. Some cough present. The patient soon fell into a typhoid state, with diarrhœa, brown dry tongue, and great prostration. The symptoms pointing to a lesion in the thorax were rather indefinite.

On the eighth day of his illness, Professor A. Jacobi was requested to see the patient in consultation. A physical examination excluded meningitis or fracture of the skull. An examination of the chest with exploratory puncture of the right plural sac revealed the existence of an acute empyema. An operation was advised, and the same evening, June 7, at the invitation of Dr. A. W. Neufeld, I opened the right pleural cavity by an incision made posteriorly below the angle of the scapula, inserted a large drainage-tube, washed out the cavity, and then applied an antiseptic dressing of iodoform gauze and borated cotton. At the same time an abscess, which first made its appearance on the fourth day over the first metatarso-phalangeal joint of the left foot, was incised, drained, and dressed antiseptically. An examination of the left side of the chest revealed dulness upon percussion, and bronchial breathing with friction-sounds at the posterior and lower part.

June 16, Dr. Neufeld asked me to see the patient again. The pleuro-pneumonia on the left side did not pursue a favor-

able course, and the doctor suspected that suppuration had occurred. An exploration with a hypodermic syringe confirmed his suspicions, and the following day the left pleura was opened. A large drainage-tube was introduced, the cavity washed out, and dressings applied. More than a pint of pus escaped. From this time on the general condition of the boy improved wonderfully. The dressings were changed every third day, and both pleural cavities carefully irrigated with warm water or warm bichloride solution (1-10,000). The fluid was allowed to flow in a gentle stream by means of a siphon-syringe held about a foot above the level of the wound. At the end of a fortnight from the time of the operations the boy was able to be taken out, and allowed to sit in the open air in a chair. With the general improvement the discharge diminished gradually, and in about a month less than one-half ounce was discovered on the dressings, which were now changed about every fourth day. Pulmonary expansion good. The lateral curvature, quite marked before the left side was operated, began to grow less, and now the patient walks pretty straight and without much stoop. The drainage-tubes, originally about three and a half inches long, have been shortened gradually, so that they only reach as far as the pleura, but do not extend into the cavity, and are only kept in position to avoid the possible danger of a reaccumulation of matter, an accident which may occur if the tubes be removed too early.

July 28.—The patient's general condition is excellent, both sides of the chest nearly equal. No dulness upon either side. The opening in the right pleura closed, and a small sinus only remains. No pus escapes upon forcible coughing from sinus or left pleural opening.

August 3.—About one-half drachm of pus expelled from the left side upon forcible coughing. Small drain inserted. The sinus on the right side has closed.

August 10.—General condition excellent. A small sinus about two inches long still present on left side.

August 25.—Sinus on left side closed ; pulmonary expansion good ; breathing distinct all over the chest ; no dulness anywhere.

Aside from the bilateral character of the disease, the cases

present several points of interest. In the histories we find that in both the affection was preceded by a fall. The question naturally comes up, Was the fall the direct cause of the double purulent effusion? In neither case were there any evidences of fracture of the ribs, wound perforation, contusion, or ecchymosis of the thoracic walls, nor was it at all probable that the lungs or pleuræ had been injured, giving rise to a hemorrhage into the sac, the blood breaking down later on and being transformed into pus. Were the latter the case, it seems but rational that blood-clots, more or less disintegrated, would have escaped with the purulent contents when the chest was opened. The relationship existing between the fall and the disease is somewhat obscure.

The bilateral character further seems to speak against traumatism as a direct cause, and would lead us rather to seek some constitutional condition. The older patient had been afflicted with general psoriasis for years, and at the time of his illness the extremities were pretty well covered with the scales. Furthermore, he was thoroughly drenched, and the exposure to the inclement weather prevailing at the time of the accident, no doubt, to one in his poor condition, was an important factor in the etiology of the case.

In the second case the boy fell about five feet, was senseless for a short time, but recovered quickly and played in the street for two hours before going home. Aside from the headache, he made no complaint, but went to bed and slept for several hours. During the night he became delirious and feverish. The pain in the chest did not come on for several days after. Aside from the mere statement of the fall and the pain complained of in the head, there is no evidence to connect his illness with the accident. No ribs were broken, nor were there any signs of injury to the thorax or other parts of the body, no swelling, no hemorrhage or wound, not even a contusion was present. The surroundings in his case and his general mode of living were unfavorable, and no doubt contributed in great measure to induce the grave type of inflammation.

Though aware of the presence of pus from an early stage of the disease in the older boy, I refrained from operating for a fortnight. My course of action in this respect may be open

to criticism. The patient was extremely emaciated, presenting the physical appearance of one in the last stage of phthisis. The feeble state, together with the excessively weak heart, made me fear that operative measures employed early would precipitate a fatal termination. In the meanwhile, heroic stimulation was resorted to, and his general condition improved. The subsequent favorable course, I believe, justified me in acting conservatively in postponing operative measures until the improvement in his general condition warranted interference with reasonable prospects of success.

No anæsthetic, local or general, was employed. The sluggish capillary circulation, the weakened heart, and the excessive dyspnœa contraindicated the use of either chloroform or ether. In fact, if incision only be practised, an anæsthetic is rarely necessary. Sensibility to pain is less acute in these cases, for the blood is but imperfectly supplied with oxygen. The circulation being necessarily interfered with and less perfectly accomplished, the blood does not receive its proper supply of oxygen, the carbonic acid is in excess, and sensation is therefore more or less obtunded. When the incisions are made through the skin there is not much pain. This I have observed in children, as well as in young adults, in the operations for empyema.

Both patients lived in thickly-populated tenements, under such poor hygienic and sanitary conditions unfortunately existing in habitations where four families are compelled to live on one floor; and yet both recovered in a comparatively short period after free incisions had been made, drainage established, and irrigations resorted to. The irrigations were practised with the restrictions to be referred to later on.

The treatment of empyema is practically that of an abscess with partly rigid walls. The walls of the pus cavity are formed by the ribs and the intermediate soft parts, by the lung more or less compressed, and the upper surface of the diaphragm. On the inner aspect we have, in addition, the pericardium covered by the pleura as one of the boundaries. The large space which remains when the pus has been allowed to escape can only be obliterated by the ascent of the diaphragm allowing the displaced viscera to resume their normal position ;

by the approximation or overlapping of the ribs ; and, finally, by the re-expansion of the lung. One or more of these factors enter into the mechanism of cure in every case. The falling in of the chest-walls and the ascent of the diaphragm, though not inconsiderable, do not suffice to obliterate the cavity. The principal rôle is played by the expansion of the lung. To secure this, early diagnosis and early operation are essential, and it is to these two points that I attribute the rapid and complete recovery in the two cases presented.

Physical signs, it is true, will tell us that fluid exists ; exploratory puncture only will determine the character, whether purulent or serous. As the result of a somewhat extended experience, I heartily endorse the following utterances of Donaldson ("Diseases of the Pleura:" Pepper's "System of Medicine," vol. iii. page 548): "We cannot forbear to urge the importance of promptly and definitely settling the diagnosis by exploratory aspiratory puncture. Properly guarded, no evil can result ; whereas a positive diagnosis enables us to act promptly with effective mechanical means of relief." I lay particular stress upon this point, for but two years ago, at a meeting of the New York Academy of Medicine, I was criticised for advocating early exploratory puncture in pleural effusions in childhood.

Our object in operating is to evacuate the pus, to provide, furthermore, a free channel for the escape of the flocculi and large masses of febrin present, and to allow the necessary irrigations and free exit of the injected solution. In acute or rather recent cases of empyema—and my remarks are intended to apply to this variety only—a free incision without any resection of the ribs answers these indications, and generally is sufficient to effect a cure. I have usually selected, as the site for the opening, the first or second intercostal space below the angle of the scapula. In this situation drainage is effectual, whether the patient is in an upright or a horizontal position. The incessant movements of the thoracic walls too assist in forcing out the pus, and the costo-diaphragmatic sinus is kept free. Immediately before operating, the exploring syringe should be inserted, as a crucial test to establish the presence of pus, at the point where the incision is to be made.

Pus being detected, the soft structures should be divided, layer by layer, to the extent of one and a half to two and a half inches, the index finger feeling the various tissues as we divide them. The pleura having been opened and the pus allowed to escape more or less slowly, according to the condition of the patient, the pulse being carefully watched, the largest size drainage-tube is inserted, and the cavity irrigated with hot water or (1-10,000) bichloride solution. An antiseptic dressing is now applied, and changed when saturated or the temperature becomes elevated. In performing irrigation the greatest caution should be observed that a gentle stream only is employed; that the fluid be at a proper temperature, and its free escape not interfered with. It has been my practice to employ a siphon irrigator, improvised from Whitall, Tatum & Co.'s siphon nasal douche, the nozzle being replaced by a piece of glass tubing, and the vessel holding the antiseptic solution being held about one and a half to two feet above the level of the wound.

This little apparatus is compact and inexpensive, and makes an excellent irrigation in general. The injections are made regularly until the flocculi and masses of fibrin have disappeared; subsequently only when the temperature is elevated or the discharge becomes offensive.

The drainage-tube is secured by employing a piece of rubber bandage one and a half inches square, with a central perforation, through which the tube split longitudinally for about an inch is passed. The divided ends are then turned down and fastened to the square of rubber (acting as a shield) with small safety-pins or wire sutures, or the split portion of the tube is turned down and transfixed with a large safety-pin, no shield being used. The latter plan I first saw used in the practice of my friend, Dr. H. M. Silver.

In Pepper's "System of Medicine" the subject of double pleurisy is dismissed in thirteen lines. This form is usually secondary to rheumatism, or more frequently it follows tuberculosis (Louis). Gangrene, too, may give rise to this variety. The progress of the disease is rapid, and the result is almost always fatal. Double empyema is not mentioned. In the various text-books the subject is not discussed. In reviewing

the literature of empyema, less than a dozen cases were met with. A list of these accompanies this paper.

Two other cases have come to my knowledge, one in the practice of Dr. A. Caillé, in which the trouble followed typhoid fever, and yet the patient recovered. The other occurred in the practice of Dr. A. F. Brugman, also recovered.

Hampeln. "Empyema Duplex."—*St. Petersb. Med. Wochenschr.*, 1881, vi. 133.

Hetherington. "Double Empyema."—*Med. Press and Cir.*, London, 1878, n. s. xxvi. 472.

Metcalf, J. T. "Empyema on the Right Side, Acute Pleurisy on the Left, simulating Pericarditis."—*N. Y. Med. Times*, 1855, iv. 277.

Demme, R. "Behandlung eines konsekutiv doppelseitigen Empyems durch Rippenresektion."—*Med. Ber. u. d. Thätigk. d. Jenner'schen Kindersp. in Bern* (1880), 1881, xviii. 93-96.

"Epanchement pleuritique successif dans les deux Côtés de la Poitrine; Double Opération d'Empyème; Guérison."—*Ann. de la Méd. physiol.*, Paris, 1834, xxv. 571.

Sangster, J. I. "Double Empyema treated by Incision and Aspiration; Recovery."—*Lancet*, London, 1880, ii. 617.

Clurton, T. "Double Hemorrhagic Pleurisy; Degeneration of Cells with Formation of Cholesterine; sub. Empyema on Right Side; Operation and Recovery, followed by Empyema of Left Side; Operation, Septicæmia, and Death."—*Tr. Clin. Soc.*, London, 1882, xv. 19-26.

Branser. "Doppelseitiger Brustschnitt."—*Aerztl. Int. Bl.*, München, 1883, xxx. 461.

Spampacchia, R. "Un Caso di Pleurite Bilateral et di Peritonite."—*Riv. Chir. et Terap.*, Napoli, 1883, v. 485.

Gardiner, H. C. "Empyema (double primary) with Recovery."—*Med. Rev.*, New York, 1888, xxxiv. 177.

Caillé, A. "Double Empyema following Typhoid Fever; Recovery."

Brugman, A. F., and Dr. Holmes. "Empyema in a Child Six Years Old; Recovery."

O'Kell. "Double Empyema; Restriction of Rib on Right Side; Incision and Free Drainage on Left Side; Recovery."—*London Lancet*, July 21, —.

DISCUSSION.

DR. A. CAILLÉ did not consider it advisable to allow pus to remain in the pleural cavity, but would evacuate it as soon as discovered. In perityphilitis, in exceptional cases, the pus may perhaps be permitted to remain for a time if the patient is in such a condition of collapse that an operation at such a time would presumably prove fatal. In pyothorax the pus is a direct impediment to the circulation by its compression of part of the lung, and it should be removed promptly.

DR. H. KOPLIK would not irrigate the pleural cavity too frequently; usually only once, immediately after operation. The re-expansion of the lung and attacks of coughing forces the pus out, and the irrigation of the pleural cavity may in some way injure the lung. The irrigator should be avoided in ordinary cases. He doubted the probability of empyema being the result of traumatism where there was no actual penetration into the pleural cavity or solution of continuity of the skin.

DR. WILLIAM PEPPER referred to the strong tendency of unilateral empyema in children to recovery under any careful mode of operative treatment. He had now operated without incision between one thousand and eleven hundred times in cases of pleural effusion; not in that number of distinct cases, but had performed the operation that number of times in all. In no instance had there been any serious consequences from the operation itself. It was impossible, speaking from memory alone, to say how many cases of empyema in children were included in this number. The instances must, however, be numerous, certainly not less than thirty or forty. In every case, without exception, recovery had followed. The operations were by aspiration, with subsequent thorough drainage, with careful asepsis. In some instances the drainage-tube was passed around one of the ribs by means of a curved needle. More frequently the drainage-tube was introduced into the chest through the canula, after the collection had been evacuated. His experience with double empyema, whether in adults or in children, had unfortunately been very different. It seems very difficult, therefore, in view of the recovery which generally follows in such cases of unilateral empyema in children, to estimate the relative merits of different modes of operating; and these remarks were offered with a view of supporting the propriety of the easier and simpler modes of operating in empyema in young children. If the condition is diagnosed promptly, and treatment is at once instituted, the prognosis is eminently favorable.

DR. WILLIAM OSLER considered empyema a surgical affection. Free, full, and satisfactory incisions should be made in case of adults, but in children aspiration should be first tried. Many cases at an early age are cured by one aspiration. The aspiration should not, I think, be repeated, but if the pus reaccumulates incision should be practised.

DR. C. P. PUTNAM was not in favor of irrigating, even once, as a routine practice, and without some special reason for it. Ordinary cases do as well or better without irrigation.

DR. W. L. CARR does not irrigate in cases of empyema,

and in dressing the wound uses antiseptic precautions. A case just seen did not have any rise of temperature after the operation. The pleural cavity was not washed out.

DR. L. EMMETT HOLT considered aspiration by a trocar and drainage through a canula as an imperfect substitute for incision. He had collected, two years ago, statistics of a large number of cases of empyema operated on by various methods. These show that while a single aspiration succeeded in a considerable number of cases of localized empyema, it was almost never successful when the empyema was generalized. Washing out the pleural cavity seemed to him unnecessary, except in cases where the contained fluids were very foul and offensive. He thought, in some cases at least, frequent irrigation of the pleural cavity served to keep up the discharge. He was strongly in favor of free incision, aspiration being used as a preliminary step.

DR. J. H. FRUITNIGHT thought that the most satisfactory results were to be achieved by incision, but that constant irrigation seemed to act as an irritant to the pleural sac.

DR. H. N. VINEBERG thought that the general practitioner did not make an exploratory puncture often enough. Empyema was frequently overlooked, and it was not uncommon to meet with cases that had been under treatment for months without their nature being recognized.

DR. A. V. MEIGS said that in empyema the opening can be made too low down, and in illustration of this point related that he had had charge of a case in the Pennsylvania Hospital in which the operation failed to cure the patient, because, though at first the drainage-tube was in the pus-sac, as the cavity healed from below and became smaller the tube ceased to empty it, and at the autopsy there was found a large amount of pus in the pleural cavity, and the drainage-tube below this lying between the ribs and diaphragm, which had become adherent to their inner surfaces.

DR. H. KOPLIK.—The point in regard to the location of the incision referred to by Dr. Meigs is also made by Professor Koenig.

DR. FRANCIS HUBER expected adverse criticism. Said that Dr. Caillé would probably have done the same under similar circumstances. Constant irrigation should only be used where there is elevated temperature and fetid discharge. He gave illustrative cases. When pus is found on the introduction of the needle, it must have been there before, and could not possibly be due to the puncture. Puncture of the lung gives rise to no ill results. It does not convert a serous into a purulent accumulation when ordinary care is observed.

THE APPARENT PHYSICAL PARADOX INVOLVED IN THE RE-EXPANSION OF A COLLAPSED LUNG WHILE A FREE OPENING REMAINS IN THE PLEURAL SAC.

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THE reinflation of a collapsed lung while the surface of that lung is freely exposed to the pressure of the atmosphere through an opening in the pleural cavity, has always appeared to me in the light of a physical paradox. None of the theories so far advanced offers any satisfactory explanation of the mechanism by which this process is accomplished. If the inspiratory movement be nothing more than the production of a partial vacuum within the chest, with consequent inrush of air until the pressure is equalized, there can be no force developed by this movement to overcome the contractility of the lung, because, the atmospheric pressure being the same in both situations, the power to create a vacuum is destroyed. Foster, in his work on physiology, in describing the mechanics of respiration, concludes as follows: "It need hardly be added that when the pleura is punctured and air can gain free admittance to the pleural chamber, the effect of the respiratory movements is simply to drive air in and out of that chamber, instead of in and out of the lungs. There is, consequently, no renewal of the air within the lungs under these circumstances."

Now, if this physiological view of the question were true, it would be easily understood. The lung would simply remain contracted as long as the external wound remained patulous, and there would then be no room for argument. But every one who is familiar with the treatment adopted for the cure of empyema knows that clinical evidence is directly opposed to the teaching of physiology in this instance. He knows not how it is accomplished, but he knows the fact that a lung that has been completely collapsed and compressed becomes so fully and perfectly reinflated that in after-years it is impossible to distinguish any difference between the two sides, and that the

principal part of this reinflation takes place while free communication exists between the pleural sac and the atmosphere. Air, therefore, does find its way into the collapsed organ, as well as into the pleural chamber, and in some manner acquires sufficient increase of power to overcome not only the resistance offered by the elasticity of the lung, but also that of the fibrinous material on its surface, and the results of the compression to which the organ had been subjected. The theories usually advanced in explanation of this phenomenon are as follows :

1. The small size of the opening in the pleural cavity, or its valvular form, produced by the dressing or otherwise, which tends in some measure to exclude the air.

2. The presence of old adhesions, which prevent complete collapse of the lung, or the formation of new ones acting in a similar manner.

3. The force brought to bear on the contracted lung by the recoil of air from the sound side in the act of coughing, or other forcible expiratory effort.

As far as the size of the opening or its valvular arrangement is concerned, I can say, from my own experience alone, that it has no influence whatever in aiding the expansion of the lung by excluding the air, as it has always been my practice to make a free opening, and keep it so by a metallic tube. The only dressing applied consisted of a thick layer of oakum, which does not interfere in the least with the free entrance and exit of air.

Old adhesions seldom exist in cases of empyema in young children, and need not be considered. Before new adhesions can form the opposing surfaces of the pleuræ must not only be brought in contact, but held in that position for some time. When the chest is completely filled with fluid before thoracentesis is resorted to, these surfaces are separated by a considerable distance at all points, and more or less expansion of the lung is necessary before they can be approximated, even at the apex, where the interval is least. Even granting that adhesions may form at the apex, where there is practically no movement of the walls of the chest, still it would be difficult to understand how they can extend downward, when we remember that the tendency of the lung is always to contract; that its

elastic tissue is always on the stretch until every particle of air is driven out and the alveolar walls are brought in contact. This contractility of the lung is no insignificant force. Hutchinson and others have estimated that in the adult male it offers a resistance to the entrance of air equal to lifting a weight of one hundred and fifty pounds with every inspiration. The mechanism by which this impediment to the inflation of the lungs is met and overcome by the action of the inspiratory muscles is as easily understood as that of a cupping-glass, so long as the walls of the chest remain air-tight.

The last theory connected with the physics of respiration that remains to be considered is the effect of forcible expiration on the collapsed lung while the glottis is either partially or completely closed. Here we have to deal, not with the pressure of the atmosphere as in inspiration, but with compressed air, the amount of compression being in proportion to the muscular effort brought to bear and the obstruction offered to its escape by the degree of closure of the glottis. Cough is probably the most powerful of these efforts, and this only will be considered.

During the first part of this act the glottis is completely closed, and it is reasonable to suppose that some of the temporarily imprisoned and condensed air will be driven in the direction of least resistance,—that is, from the sound into the contracted lung.

When discussing this subject on a former occasion I referred to the act of coughing as probably accomplishing nothing more than starting the process of dilatation. But since that time, and especially since studying the subject of hernia of the lung, I am convinced that the dilating effect of this act is very great. Hernia of the lung, though very rare, even as a primary accident of penetrating wounds of the thorax, does sometimes occur secondarily.

While the contractile power of the lungs is great they also possess the opposite quality of distensibility to a marked degree, and are capable of being expanded far beyond the limits of the cavities that contain them without injury to their tissues. If a wound be made in the chest, without injuring the visceral pleura, at the end of a full inspiration or the beginning of a

forced expiration, it is easy to understand how a portion of the lung may be forced through the opening. But in the case of secondary protrusion, where the opening has existed for some time and the lung is collapsed, reinflation can occur only by means of air pumped in from the sound side by the act of coughing or other violent expiratory effort.

There can be no doubt, therefore, that were this act repeated with anything approaching the frequency of the normal respiratory movements, it would not only be sufficient to re-expand a contracted lung, but to hold it in that position indefinitely, regardless of the size of the aperture in the pleural chamber; provided, of course, that the other lung remain intact to supply the air necessary for the expiratory muscles to act on. But here we are met with two serious objections to this apparently satisfactory solution of this perplexing question: (1) that the cough is not repeated often enough,—in fact, some children with empyema cough very little; (2) that this act cannot be effective when both pleural cavities are open at the same time, as in the cases of double empyema reported by Dr. Huber.

Assuming that the lung is expanded by a fit of coughing until the visceral and parietal pleuræ are brought in contact, the moment the distending force is removed contraction begins and continues, if not again interrupted, until the organ is reduced to a state of atelectasis. There is also the inspiratory expansion of the chest operating in the opposite direction, which draws the ribs away from the lung before there is time for adhesions to form. When both pleural cavities are open at the same time, there can be no recoil of air from one lung to the other, because both organs are practically in the same condition; and unless adhesions exist over the still permeable portions, sufficiently strong to resist the weight of the atmosphere when admitted, it is difficult to understand how inspiration can be carried on at all, or life be sustained even for a moment. Dr. Weissberger, in an article on this subject, published in the *Berliner Wochenschrift* of February 24, 1879, takes it for granted that the positive expiratory pressure, aided by the negative pressure of inspiration, produces sufficient expansion of the contracted lung to allow adhesions to take place above, and then endeavors to demonstrate the manner in which

the inflation extends downward where the pleural surfaces are more widely separated. In other words, he assumes the accomplishment of the very steps of the process that are the most difficult to explain or understand, and this is the weak point in all these theories.

In the paper already referred to* I suggested the possibility of a physico-chemical force generated by the interchange of gases in the pulmonary vesicles, which would supplement the pressure of the atmosphere in drawing air into the lungs, or at least in holding it there when once admitted. If such a force exist, it must be the result of attraction between the oxygen and the hæmoglobin, for here we have to do, not with simple diffusion, but a chemical union. This hypothesis is sustained by Draper's theory that the capillary circulation is carried on by an attraction, nutritive or chemical, existing between the blood and the tissues, and that the force thus generated is sufficient to draw the blood into and through the capillaries from the terminal arteries, where it is deposited by the heart. But there can be no nutritive attraction in the lungs, because the blood is sent there only to receive its supply of oxygen and get rid of its excrementitious products. Here the attraction of the oxygen for the hæmoglobin is substituted for that of the tissues, and if the force be sufficient to draw the blood through the pulmonary capillaries it operates equally in the opposite direction, and aids in retaining the air in alveoli and keeping them patulous, if nothing more.

The mechanical theory of the circulation, which assumes that the action of the heart is sufficient to propel the blood through the whole circuit, from the left back to the right ventricle, does not explain the important fact that venous blood will not circulate in the systemic capillaries. Now, venous blood contains all the elements of nutrition excepting oxygen, and also contains more water than arterial blood, yet the same action of the heart cannot drive it through the capillaries, because there is no attraction between it and the tissues. The fact that defibrinated venous blood can be driven through the double capillary circulation of the intestines and

* *New York Medical Journal*, March 9, 1889.

liver after death with less force than the normal arterial pressure proves nothing. All physiologists admit that it does not occur during life.

Flint, who claims that the power of the heart alone is sufficient to carry on the circulation, speaks on this question as follows: "The distention of the heart in asphyxia is, therefore, due to the fact that unaërated blood cannot circulate in systemic capillaries."

There is still another factor that may contribute to some extent in preventing the rapid collapse of a functionally active lung. This is the vaporization of a considerable amount of water existing in the liquid state in the capillaries, and suddenly converted into vapor in the alveoli, the escape of which is retarded by the many minute and tortuous channels through which it has to pass. An adult exhales with the breath about twenty ounces of water in twenty-four hours. Roughly estimated, a cubic inch of water represents a cubic foot of steam. Such a vast increase in volume of even a small quantity of water must exert some mechanical effect in keeping the pulmonary vesicles and smaller air-passages pervious, or, in other words, assist in keeping the lung expanded.

From the foregoing facts, I think we can understand the process by which a collapsed lung, under the conditions described, is re-expanded, even until the pleural surfaces are brought together; but it appears to me that some other force of such a nature as I have suggested is necessary to hold it in that position long enough for adhesions to form.

DISCUSSION.

DR. W. P. NORTHRUP, of New York, said: Dr. O'Dwyer, on a former occasion, in a partial discussion of the present subject, quoted extensively from a "Bradshawe Lecture on Pneumothorax," by Samuel West, F.R.C.P., London. In that lecture, quoted by Dr. O'Dwyer, are these words: "The fact, therefore, that the pleural cavity may be laid open, and that yet collapse of the lung with consequent pneumothorax may not occur, must be accepted and an explanation sought." Again: "When the lung does not contract after the pleura is opened, it must be kept on the stretch by some force greater than seven millimetres of mercury (the force of normal elas-

ticity of the lungs, Donders and Hutchinson), and there seems to be no place for such force to exist, unless it be in the pleura itself; and if here, it is probably to be found in the *cohesion* between the two serous surfaces." Then follows elaborate experiments with disks of wood, upon which are stretched stomachs and other membranes, the cohesion of which when wetted and applied, the one to the other, shall demonstrate that a lung will not let go its hold upon the parietal pleura except under force directly applied. I quote still further, in order that we may in no point misapprehend his meaning.

He continues: "The result of these observations is to prove that there is some force other than atmospheric pressure by which those two smooth surfaces are held together; and without using the term in too technical a sense, I may speak of it as cohesion." Again: "Pneumothorax can therefore no longer be regarded as a condition to which there is an inherent tendency in the healthy body, but, on the contrary, as a condition brought about by the forcible separation of the pleural surfaces, and in this respect exactly analogous to the distention of the subcutaneous tissue which occurs in surgical emphysema. . . . It would seem to follow as a corollary that the force required to distend the subcutaneous tissue must be less than that required to separate the layers of the pleura. . . . Surgical emphysema . . . may in reality be a protection against it (pneumothorax), the air making its way in the direction of least resistance beneath the skin rather than between the pleural surfaces. It is evident, further, that where the pleura is laid freely open, so that the air passes away without hinderance on expiration, the liability to pneumothorax will be still further reduced."

It occurred to me that the simplest way to ascertain the behavior of the lung when the pleura was opened was to open a pleura and look at it. Disks of wood covered with stomach may be better, but are difficult to get, and dogs are plenty; besides, the conditions may not be identical. I am indebted for these experiments to the courtesies of the Loomis Laboratory and to the valuable assistance of the director of its physiological department, Professor W. Gilman Thompson, and his assistant, Dr. Cardwell.

Question: Is there sufficient cohesion between the two pleural surfaces to maintain them in apposition, the costal pleura having been opened without injury or violence to subjacent tissues?

EXPERIMENT I.—A street cur weighing about twenty-five pounds. Ether.

Having trimmed away the hair, a free incision was made

parallel with the sixth and seventh ribs, reaching down to the intercostal muscles at a point midway between their angles and their sternal cartilages. The intercostals were cut upon a grooved director till no tissue overlay the lung at the bottom of the incision, except the parietal pleura. Through it could be seen the fully-expanded lung gliding back and forth in rhythmic respiration. The pleura was then lifted on a fine-pointed forceps, and a pin-hole opening made in the parietal pleura, without injury to the visceral layer, and without allowing any force to crowd the lung away from the ribs or separate the two serous leaves. Even with a pin-hole opening there was an instantaneous recession of the lung; on the next expiration a fine thread of air was expelled, and by the second respiration the lung was not to be seen at all, and a probe passed two and a half inches straight down before it reached the lung.

EXPERIMENTS II., III., IV., and V. were followed by exactly the same results in every particular, and were performed on dogs of various sizes and conditions of nutrition, but all healthy. According to Mr. Samuel West's experiments, reported by himself, we should expect the force of cohesion to keep the pleural surfaces gliding upon each other on all margins of the fenestra. Disks of wood covered with stomach and divers membranes, according to West, cohered with a force equal to and more than seven millimetres of mercury, the estimated elasticity of the normal lung.

EXPERIMENT, SECOND SERIES.—Made with a view to learn something of the behavior of the lungs when one and then both pleuræ have been opened. A strong, well-nourished dog, of about twenty pounds weight, was etherized, and a double-flanged canula, the diameter of the hollow cylinder being half an inch, was inserted (buttoned in) between the sixth and seventh ribs, about midway between their angles and the costal cartilages. Dyspnœa became marked immediately on entrance of air to the pleural cavity, the animal, of course, lying upon the more useful lung. The operation completed and the lips of the wound stitched about the canula, a close-fitting cork was inserted at the end of expiration. Immediately the breathing became slower and less labored and finally the animal seemed to be suffering no embarrassment whatever from the opening.

The same operation was then performed on the other pleura of the same dog, a canula of three-fourths of an inch diameter inserted and corked tightly at the moment of finished expiration. The dog was placed on the floor and allowed to come out of ether: he was shortly on his feet, trotted back to his old corner, breathed to all appearances like any dog that had taken ether, and suffered no further interference. When led,

he trotted about, wagged his tail, and seemed comfortable; when fully recovered and standing in the middle of the laboratory, one cork was withdrawn without any immediate effect. When led away from the operation-table he trotted cheerfully, wagging his tail; when headed towards the table and ether he struggled with vigor, these exercises causing some dyspnoea, but not much. The half inch canula was the one open at this time. After a little rest, with both corks in, and standing in the same place, both corks were simultaneously removed, and the dog left to himself. He stood for a moment dazed, panting moderately, answered a chirping call, wagged his tail, and trotted off into the next room, among the monkeys and guinea-pigs. From there he was brought back, struggling moderately, and tied to a table-leg. This was about two minutes from the removal of both corks.

Now began his severe dyspnoea, and it seemed to come over him rather suddenly. He swayed to and fro, his eyes, tongue, and lips became dusky, and with feet braced wide apart he wavered and settled slowly to the floor. Here he lay flat on his belly, panting. Both corks were now replaced as before, catching the moment of finished expiration, in order to leave as little air as possible in the pleural cavity. In a few moments he was again as good as new. With one cork out the dog had suffered no dyspnoea when quiet, out of ether, and on his feet; with both out he succumbed in two minutes to urgent dyspnoea with deep cyanosis. I may add that the result of this experiment is quite in accord with the experience of Dr. Thompson on a former occasion.

EXPERIMENTS, THIRD SERIES.—A small street cur, poorly nourished, weighing about ten pounds, having served for another experiment, was subjected to further operation, being still under ether. A large opening was made in his thorax, practically obliterating one wall. Dyspnoea and shock were severe, and the animal seemed about to succumb. Just at the instant of a severe spasm of the abdominal muscles with spasmodic closure of the glottis, a piece of plain glass was clapped upon the wet tissues of the thoracic wall, completing temporarily its continuity and enabling the animal, after some assistance, to resume respiration: the observers were edified to see the lung gradually expand, become rose-colored, and nearly fill the cavity, which it would probably do in a moment more. Just then the dog, which was a poor subject, ceased breathing altogether and died.

Acting on the suggestion just received, we made haste to etherize a strong, well-nourished dog of twenty-five pounds, selected a site of operation, and proceeded to make a window in

his chest. Provided with a circular glass, we made a cut in the skin just sufficient to let the glass pass like a button through a button-hole, cut down upon the sixth and seventh ribs in the usual location, stripped off their peritoneum, and cut out two inches of the bones, gathered the pleura containing the vessels belonging to the two ribs within two ligatures, at the proximal edge of the wound, and snipped away the pleural membrane, leaving a nearly bloodless wound, about a fenestra two by two inches.

The dog being allowed to come out of the ether a trifle, gave a spasmodic expiratory impulse; the glass disk was buttoned quickly through the slit in the skin and instantly respiration improved. A single stitch rendered it assured that the bull's eye would not slip away, and the dog was allowed to get rid of more of his ether. The glass window acted secondarily like a valve. At each respiration a few bubbles escaped at the margin, but no air entered. Finally the lung was fully expanded, and gliding rhythmically back and forth upon the glass as upon the pleura-covered wall. At this point the dog evinced great activity, got upon the floor, walked about, wagged his tail, and went to his old corner. He was quickly secured, and to save suffering was etherized to death.

THE PRESIDENT.—What would Dr. Northrup conclude from his experiments? Would he conclude that as soon as the chest is opened the lung will collapse entirely or to a certain extent; that it will not expand entirely while the chest remains open but that it will expand to a certain extent?

DR. NORTHRUP.—My first conclusion is that Mr. Samuel West was wrong. His experiments might work with disks of wood and membranes, but not with the pleura. In further answer, I would say that it has seemed to me that there is a state of equilibrium, with the elasticity of the lung on one side, and on the other the pressure of the air within, assisted by a certain amount of force from the blood, the blood-vessels acting, if I may say so, as erectile tissue. There is not complete collapse, and the lung fluctuates in the anterior and upper portions in unison with the motion of the other lung.

As to the last half of the question: Will the lung expand entirely or in part, the chest-wall remaining open?

I have adhered thus far strictly to facts, and a few facts are the only contribution I intend to make to the discussion. All the dogs under observation, while recovering from ether, made repeated attempts at vomiting,—that is, with closed epiglottis they tried by means of their abdominal and thoracic muscles to express the contents of the stomach through the œsophagus, which act is very similar to the act of coughing. In the re-

peated retchings one dog failed to express the contents of his stomach, but did compress the sound lung, and force air from it into the contracted lung, till, from being small and cyanotic, it became aerated, rose-colored, and expanded to its full capacity. In another case the lung was forced out through the canular opening, which was an inch and a quarter long from within out. This was, in fact, an exaggerated pulmonary hernia. Its expansion was complete at the moment, but, there being nothing to maintain its expansion, it immediately contracted again. This muscular action is similar to and almost identical with that of coughing, and serves to fortify the position taken by Dr. O'Dwyer that cough exerts the strongest expiratory force.

One practical point is suggested to my mind by the behavior of the lung under the glass window. It will be remembered that the plain glass, pressed against the wet tissues, acted like a valve, allowing air to bubble past its edges on expiration, but becoming the closer applied on inspiration, and air-tight. It soon came about, especially if the animal made any attempt at vomiting, that the lung was fully expanded and aerated, and in this condition, by means of the glass, could be maintained. It suggests to my mind the desirability of a valvular canula with which to drain empyemic chests. I wish also to say that, in my experience and observation, all dressings which catch the tenacious discharge from an empyemic cavity can act more or less as a valve. Take oakum, even, and its coarse meshes may become filled, and form against the end of the tube, whether hard or flexible, a pad which will allow the exit of pus and air, but which, on inspiration, will apply itself to the aperture, and effect, more or less effectually, a closure,—sufficiently, at least, to disturb the equilibrium in favor of diminished external pressure.

THE PRESIDENT.—The experiments of Dr. Northrup would seem to show that when a hole is made in the chest-wall the lung collapses, but when the hole is closed the lung expands. But it must be closed air-tight. This would correspond with what Dr. O'Dwyer assumes. Dr. O'Dwyer says that the lung expands. Why does it? Dr. Northrup says that it does not expand so long as the chest-wall is open.

DR. NORTHROP.—The lung of dogs does not.

DR. O'DWYER.—The experiments of Dr. Northrup were of very short duration.

DR. W. L. CARR.—In the *Medico-Chirurgical Transactions*, vol. lix. p. 165, is an article by Douglass Powell, "On Some Effects of Lung Elasticity in Health and Disease." He makes the statement "that we recognize the fact that in the

normal position of thoracic repose the contractility of the lung is exactly counterpoised by the elastic resilience of the chest-wall. This may be called the eccentric thoracic resistance. It is obvious, however, that the elasticity of the chest-wall is a force not only in favor of inspiration at the commencement, but against expiration at the termination of the respiratory act. It renders easier the expansion of the chest by neutralizing the first resistance and inertia of the lungs, and in the final contraction of the chest in expiration exercises a buffer-like action in taking off the shock of recoil."

In connection with some of the questions raised by Dr. O'Dwyer, it may be well to quote from some of the authorities. According to Ewald, we find in open pneumothorax not over five per cent. of carbonic acid, and almost twelve to eighteen per cent. of oxygen. In closed pneumothorax, however, we find fifteen to twenty per cent. of carbonic acid, and ten per cent. at the most of oxygen.

Fagge, in his "Principles and Practice of Medicine," vol. i. p. 943, states that in some very exceptional cases of pneumothorax the air gradually undergoes absorption, and complete recovery takes place. On page 936 he says that the chemical nature of the air was investigated by Dr. John Davy (*Phil. Trans.*, 1823) many years ago, and analyses have since been made by other chemists. It has always been found to consist mainly of nitrogen, and the amount of carbonic acid in it has generally been greater than that of the oxygen. . . . Obviously, therefore, it must have undergone change while in the serous space, either as the result of action upon it of liquid effusion, or in consequence of the absorbent energy of the pleural membrane, which is very considerable.

Of further interest, I will read the following from a personal letter from Dr. William H. Welch, of Baltimore.

"I have never noticed any expansion of the lung exposed freely to the atmosphere by an opening in the chest-wall. I have made experiments upon animals bearing upon this point, and am prepared to assert quite positively that under these conditions no expansion takes place, nor can I conceive it possible that the physical conditions admit of any expansion.

"I cannot understand in what way the inspiratory force of the diaphragm and of the accessory muscles of respiration could suffice to produce any expansion of a lung freely exposed to atmospheric pressure through an opening in the pleural cavity. If you will test the matter on any lung removed from the body or in the chest, subject to the conditions named, I think that you will find that the elasticity of the

lung has no power to cause expansion of the lung after the pressure of fluid from the external surface of the lung is removed. Unquestionably there is some interchange of gases between the blood in the subpleural blood-vessels and the atmosphere in the pleural cavity. I should suppose that the thickness of the pulmonary pleura would interfere materially with the rapidity of this gaseous interchange.

"I should say that with or without paracentesis, if the entrance of air through the bronchial tubes is prevented, the lung will collapse, certainly not expand. Experiments have been made which show that under these circumstances the gases are absorbed from the air-cells, which then collapse.

"The arrangement of the blood-vessels in the pleural membrane is not adapted for anything like so rapid an interchange of gases from this surface as is the arrangement of blood-vessels in the air-cells, and I cannot imagine that, even with a free exposure of the pleural surface to direct atmospheric pressure, there can be from this surface as rapid an interchange of gases as from the walls of the air-cells.

"I apprehend that the basis for the discussion of the point as to the possibility of expansion of a lung while there is still an opening in the chest-wall must be observation of cases where adhesions have formed between the pleural surfaces. Such adhesions must alter the physical conditions, and it is quite possible to understand how these adhesions could be arranged as to permit of considerable pulmonary expansion, even when there is an opening in the thoracic wall."

We must remember that in most cases the collapse of the lung is caused by an inflammatory condition which interferes with the normal expansion and aëration, while after the paracentesis it is possible, as the authors quoted show, for the pleural surface with its underlying blood-vessels to absorb a certain amount of oxygen, even when exposed to the atmospheric pressure. The close association between the action of the chest-wall and the lung has of course been interfered with, and some of the apparent pulmonary expansion is perhaps due to a change in the expansion of the thorax.

THE PRESIDENT.—I understand that Dr. Welch says that no expansion of the lung can take place while there is an opening in the chest. We, however, know, as the result of clinical observation, that the lung does expand nevertheless. No reasoning can gainsay the fact. What we observe at the sick-bed is just as accurate as what is observed in dogs, particularly dogs under the influence of chloroform or ether, whose muscular tissue probably does not act as does normal muscular tissue. No theory will do away with the fact that

a lung which is not closely adhering or compressed by bands or splenization, does expand after thoracocentesis.

DR. JOHN A. JEFFRIES, Boston.—It is a fair question to ask whether or not any dressing was applied in these cases. Again, when we have the pleura covered with fibrin there is a different cohesion from that of the ordinary pleura. Then there is a certain possibility of mechanical union, and slow contraction as connective tissue forms from the sides of the cavity.

THE PRESIDENT.—Does Dr. O'Dwyer believe that the lung will never be held back except by adhesions?

DR. O'DWYER.—I claim that the lung can be expanded by the simple mechanical movement of expiration, the air being forced from one lung to the other. I claim that hernia of the lung can be produced by this force. I, however, do not know of any reason why the two surfaces should remain in contact. That is the only mystery. If adhesions occur, that explains everything.

THE PRESIDENT.—Dr. O'Dwyer states that if there is an opening in the left pleura the left lung will be expanded once or a number of times by air coming from the other lung by cough or the acts of respiration. Expiration, however, tends to compress the lung. It would act as a means of expansion only in distant parts of the lung, mainly in the alveoli of the posterior parts. If it is so that the lung is expanded by the air from the other lung, I should say that there is always more air in the lung than we have use for. It has been the astonishment of all critics that sufficient air should enter through the small opening in O'Dwyer's intubation tube. This shows that we inhale a great deal more air than we require or have use for. If, for instance, there is an opening in the left chest, and the inspiratory muscles perform their function, the large and small bronchi would be filled to such an extent, and there would be sufficient residual air to fill the other lung, during the inspiratory act, and also during expiration (particularly during a cough). The amount of air inhaled is so unnecessarily large that most of the air we inhale will be expelled absolutely unchanged. That, in Dr. O'Dwyer's opinion, would be a sufficient supply of air and a sufficient way to explain the expansion of the lung.

DR. O'DWYER.—It makes no difference how much air there is in the lung, you cannot get it into the contracted lung, because it is held by a considerable force of contraction, and, besides, by the thickening of the pleura. It is a physiological fact that in ordinary expiration the air is compressed to a certain extent, but when you close the glottis and subject the

air to a much greater pressure, a certain amount must be forced into the other lung. There can be no inspiratory force that will have any effect on the contracted lung. I claim that there is no other way of explaining the inflation of a collapsed lung except by the mechanical effect of forced expiration.

NOISY RESPIRATION IN CHILDREN.

BY DILLON BROWN, M.D.,
New York.

THIS symptom is a prominent feature of one of the most fatal and dreaded diseases of childhood,—laryngeal diphtheria,—as well as of one of the mildest and most frequent,—spasmodic laryngitis. It is common to many diseases in which the indications for treatment are directly opposed to each other, and it is met with in a certain number of cases in which a fatal result will ensue unless a correct diagnosis be made and the proper treatment carried out. Hence the importance of making a careful examination cannot be overestimated; and this group of diseases includes so many conditions that closely resemble each other that it is of the greatest necessity to arrive at the diagnosis by exclusion.

In the great majority of cases this symptom is caused by some obstruction during respiration to the free passage of air through its natural channels. This may be the result either of disease or foreign bodies in the air-passages, or of changes in the neighborhood of them, which produce pressure either upon the nerves or upon the air-passages themselves. It is true that we meet a stertorous respiration in some cerebral lesions, a moaning expiration in pneumonia, frequent sighing and irregular breathing in tubercular meningitis, a short grunting respiration in vertebral caries of the dorsal and lower cervical region, and a loud blowing sound when there is a direct opening into the larynx or trachea; but there should be no difficulty in excluding these diseases, as well as those cases of slight nasal obstruction which produce snoring during sleep. There is no excuse for confounding a pneu-

monia with croup, and it can only be the result of a very careless examination, although the diagnosis may be very obscure if the child is moribund when seen for the first time.

Hysteria is apt to simulate a great variety of diseases, and often gives rise to much difficulty in diagnosis. Its manifestations are so varied that it is only after a careful study of the symptoms of actual disease that a correct opinion can be formed. *Hysteria* invariably overacts its part and there is a tendency to exaggerate subjective symptoms.

NASO-PHARYNGEAL OBSTRUCTION.

Here we get many symptoms which are common to obstruction in the larynx and trachea, in consequence giving rise to confusion. In both forms there is the noisy respiration; the dyspnoea, with recessions of the soft parts of the chest-walls on inspiration; the restlessness, the cyanosis, and other evidences of diminished air-supply; the croupy cough, and the increased frequency of the respirations. The differential points are the character of the respiratory sound, which is stertorous and rattling, and of the voice, which is clear, although it has a peculiar nasal quality. Other signs, which indicate disease of the naso-pharynx rather than of other parts of the air-passages, are nasal discharge, excoriations about the mouth or nose, fetid breath, deafness, enlarged cervical or post-pharyngeal glands, pain in the pharynx which may extend to the ears on deglutition, epiphora, and epistaxis. The diagnosis can usually be made at once and positively by inspection of the pharynx and the nares, although it may be necessary to combine this with a careful digital examination. Unless this is done, a post-pharyngeal abscess or a tumor or foreign body in the nares might be overlooked. When there is disease in both the larynx and the naso-pharynx, as is not uncommon in diphtheria, it is very difficult to determine which is the chief cause of the dyspnoea.

Scalds can be excluded from the history of the case. In *herpetic angina* the apparent pseudo-membrane is easily washed away, leaving the characteristic vesicles and the resulting ulcers

of this disease. It runs a very short course, and may be accompanied by herpes on the lips and elsewhere. The lymphatic glands are not involved, and there is seldom any great obstruction to the passage of air unless the larynx is involved. When the respiration is embarrassed in *syphilis* of the pharynx, it is due either to cicatrices or to gummata, both of which manifestations are easily recognized, especially when viewed in connection with the history of the case. In the ordinary *follicular amygdalitis* the tonsils are not sufficiently swollen to produce a noisy respiration, but in the *phlegmonous* form, with or without suppuration, there may be a loud snoring respiration, accompanied by the most intense dyspnoea. It is an acute disease, marked by great prostration, and begins with a chill or convulsion and high fever. The tonsils are swollen and red, and this condition extends to the neighboring soft parts, —the uvula, the soft palate, and the pillars of the fauces. In some cases the swelling is enormous. The breath is fetid, due to the decomposition of retained epithelial structures within the recesses of the tonsils; there is pain in the pharynx, which shoots up into the ears on deglutition; and there is more or less deafness, which is caused by extension of the inflammation to the Eustachian tube, rather than by pressure upon it. The voice has a peculiar nasal twang which is very characteristic, and the pharynx soon becomes filled with secretions, which interfere with both respiration and articulation. Glandular enlargement may be present, as well as albuminuria, which occurs in many catarrhal conditions with fever in children. The differential diagnosis between this disease and *diphtheria* depends upon the presence or absence of pseudo-membrane, and there is usually no difficulty in separating the two conditions when fully developed. There may be great difficulty in making an accurate and complete inspection of the pharynx, especially in infants; and the appearances may be masked by the accumulation of a large amount of secretion, which may prevent a good view of the mucous membrane, or may simulate a fibrinous exudation. It may be necessary to wash out the pharynx and free its surface of this mucus and other material before a positive diagnosis can be made.

Retro-pharyngeal abscess can be distinguished without diffi-

culty if a careful digital examination is made, the soft, doughy feeling of the posterior wall of the pharynx being very characteristic. Even inspection may show a swelling in this location, protruding up between the soft parts, and when this disease has been overlooked it is because it has not been thought of on account of its comparative rarity. It is more common during the first year of life than at a later period, and may be due to vertebral caries, nasal disease, tuberculosis, or syphilis; or it may follow scarlet fever, diphtheria, measles, and erysipelas. Constitutional disturbances will be absent if it is the result of a chronic process. Its characteristic symptoms are pain on swallowing or on pressure on the larynx and neck; the dyspnoea is increased on lying down, and when pressure is made on the larynx it is subject to remissions; the neck is stiff and often swollen, and the larynx may be prominent or pushed out of its normal position. The obstruction is on inspiration chiefly, although when the disease is well advanced expiration may be also obstructed. The respiration has a peculiar grating or whistling sound. The voice has a nasal quality, but is usually clear, and the cough is dry, hard, and may be paroxysmal, as in pertussis.

The most frequent varieties of *naso-pharyngeal tumors* are the mucous and the fibrous polypi, the latter of which may grow very large and spread in every direction. Among other varieties are the adenoid vegetations, cysts, sarcomata, etc., and their diagnosis must be made by inspection, although a digital examination may be of great assistance. There is reported, besides other rare tumors in this situation, the case of a *meningocele*, which protruded through the nasal roof and hung down from the mouth, having passed through a congenital fissure of the palate. Phlegmons, or tumors of the *tongue*, may obstruct the pharynx, as well as the curious congenital affection called *macroglossia*. In this latter condition the tongue may become enormously enlarged, in one case measuring six and a half inches in length and ten inches in circumference. It may be so large as to deform the teeth and alveolus, or even dislocate the jaw, and it may project from the mouth far enough to reach the episternal notch. In *cut-throat* in which the attachments of the tongue are severed, in cases of *tongue-*

tie in which the frænum and subjacent muscles are too freely divided, and in complete *anæsthesia* when its muscular attachments are relaxed, the tongue may be turned over into the pharynx and press upon the larynx, causing suffocation.

Foreign bodies of the greatest variety may become impacted in the fauces or lower part of the pharynx, and consequently interfere with respiration, among the most remarkable cases being that of a live catfish which jumped into the mouth of an adult bather during swimming, and became impacted in the fauces. It is said that this is not a rare accident in India.

LARYNGEAL AND TRACHEAL OBSTRUCTION.

Tracheal obstruction unaccompanied by the same condition in the larynx or the bronchi is rare. The calibre of this portion of the air-tract is so great that it requires an intense type of inflammation, or a very large foreign body to seriously interfere with respiration. In the majority of cases a marked degree of stenosis in this location is due either to external pressure or to cicatricial contractions. It is distinguished from laryngeal stenosis by the voice, which is clear, and by the fact that there are no downward movements of the larynx during inspiration, owing to the great elasticity of this tube, which allows considerable motion on itself without displacing the larynx.

The differential diagnosis between naso-pharyngeal and laryngeal disease is usually not very difficult. The characteristic signs of involvement of the larynx are the voice, which is hoarse or absent; the breathing, which, instead of being snoring and rattling, is hard, brassy, and croupy, and with each inspiration there is a downward movement of the larynx. In both the obstruction is solely or most marked on inspiration, but it should be remembered that in a certain small proportion of the cases of laryngeal diphtheria the expiratory obstruction may be the greater, in which case, although the respiratory muscles will be seen to be actively at work, the recessions of the soft parts of the chest-walls during inspiration will disappear, and instead there will be an emphysematous condition of the lungs, and during each expiration the chest will become barrel-shaped and swollen. This expira-

tory obstruction may be due to enlargement of the bronchial glands, which are situated at the bifurcation of the trachea. It is the bronchial glands which are involved in diphtheria of the larynx. Again, the disease may be confined to the subglottic region of the larynx, and this is especially frequent in ascending croup. In this event the voice will be unaffected, but all the other signs of laryngeal stenosis will be present. The characteristic of these cases is the rapid increase of the obstruction, often proving fatal in a few hours, and before the inflammation has had time to extend to the vocal cords.

A laryngoscopic examination may give brilliant results, and in tumors and in some chronic lesions a positive diagnosis cannot be made without it in a certain number of cases. However, in the great majority of cases this is not only not necessary, but is almost impossible, and may be the means of doing great harm.

The history of the case will exclude the *laryngitis* and *cedema of the glottis*, which is caused by scalds. It results in such an intense inflammation that the mucous membrane is covered with an exudation that closely resembles pseudo-membrane. The peculiarity of this type of injury is that evidences of stenosis do not appear until a variable period after the scald, during which interval there is such a complete absence of bad symptoms that the surgeon may be led to believe that the laryngeal tissues have escaped serious harm.

Laryngeal diphtheria is the important disease of the larynx in children. When there is also diphtheria in the pharynx or nares, the diagnosis presents no difficulties. In such cases the presence of a whispering voice or of aphonia, a croupy cough and respiration, and a laryngeal stenosis which is growing progressively worse, positively indicate membranous occlusion. When confined to the larynx, unless membrane has been coughed up, it may be difficult to exclude *stridulous laryngitis*, or false croup, which is a catarrhal laryngitis with superadded spasm. The characteristic phenomena of laryngeal diphtheria are the absence of fever at the onset of the disease; the muffled whispering character or the absence of the voice; the constant presence of the stenosis, which in the beginning is

very slight, but grows progressively worse and soon involves both inspiration and expiration ; the rough sawing respiration, which is not necessarily very loud ; the croupy cough, and the albuminuria, which is so often present without fever. On the other hand, false croup has a temperature of 102° to 105° at its onset, and all the symptoms reach their greatest intensity more quickly and seem more formidable. The attack comes on suddenly, and usually in the night during sleep. The voice is hoarse and loud, the cough is barking and sonorous, the inspiration is accompanied by a loud whistling stridor, while the expiration is comparatively noiseless, and albuminuria is usually absent, although it may be present, as it can in all catarrhal conditions in children. During the intervals between the attacks the voice and cough are croupy, but the respiration is quiet, unless the catarrh has extended to the bronchi, in which case there may be constant obstruction. A *simple laryngitis* is rare in children, except as the result of syphilis. The symptoms are identical with those of false croup, without the spasmodic element, and the diagnosis may depend upon finding other evidences of syphilis, or upon obtaining a laryngoscopic examination. A chronic form, which is very obstinate, may follow measles and the acute diseases of the larynx, but it seldom interferes with the respiration. *Edema of the glottis* without inflammation is sometimes a symptom of acute nephritis, especially the form which is so frequent a sequel of scarlatina. Usually, however, it is accompanied by some inflammation of the larynx, and is the result of a scald, or it is a complication of one of the acute specific diseases. The obstruction is entirely upon inspiration, and much light may be thrown upon the diagnosis by a digital examination, for, if the finger is trained, the thickened epiglottis and ary-epiglottic folds may be often felt.

Herpes is said to sometimes invade the larynx and embarrass the respiration. The presence of herpes elsewhere may aid in determining its character, but it seems to me that even a laryngoscopic examination would fail to give us a positive diagnosis, except under the most favorable circumstances.

Tubercular laryngitis is rare. It is a chronic disease, and is accompanied almost without exception by involvement of

the lungs. The main features are the voice, which is thick and husky, not whispering, as in the adult; the absence of pain, either on pressure or on deglutition; the cough, which is little altered and has no metallic or ringing quality; the hoarse inspiratory stridor, the elevation of temperature, and the presence of physical signs of phthisis in the chest. There are usually ulcerations, which have a characteristic location and appearance, and therefore the laryngoscopic examination is of great value. In *laryngismus stridulus* we get a pure spasm, arising from reflex irritation. It is often associated with rickets, and usually occurs in infants. As soon as the spasm relaxes the breath is drawn in with a crowing or hissing sound, very much like the whoop of pertussis, and the attack is over, or possibly the child may vomit or cry. At the same time there may be spasm in some of the voluntary muscles,—e.g., the fingers may be clinched upon the thumbs and the toes flexed under the feet. The attacks are short, but may be frequent, and during the intervals the child is quiet. There is no fever and no hoarseness.

When a *foreign body* gets into the larynx it may become lodged in the chink of the glottis or in a ventricle, in which latter position it may cause no inconvenience. It is not a rare accident, and includes the most varied list of articles. The most characteristic symptoms are the sudden onset of the dyspnoea, the violent convulsive cough, and the feeling of suffocation, which appear, not at night as in spasmodic laryngitis, but during the day, when the child is awake and at play. The voice is suppressed, the dyspnoea is continuous or with only slight remissions, and there is pain which is located at some fixed point in the air-passages, most frequently in the larynx, but sometimes in the trachea or lungs. The testimony of the parents may throw light upon the subject, both as to its presence and its nature. When the body remains in the trachea it is usually movable, and the only symptoms would be a paroxysmal cough and a peculiar flapping noise heard both at a distance and on auscultation, in the direction of the larynx, which is caused by the movements of the body during respiration. A very unique case is reported by McNamara, in which a whistle made from a plum-stone became lodged transversely

in the lower part of the larynx, and gave rise to a whistle as the air passed through it in expiration. The only inconvenience was an occasional suffocative cough. Foreign bodies in the œsophagus may press upon the larynx or trachea, and give rise to the same train of symptoms as when present in the air-passages. The differential points are the voice, which is usually unaffected, although it may be hoarse, and deglutition, which cannot be accomplished without causing pain or producing cough and regurgitation of the food through the nose and mouth. The œsophagus may be explored by a bougie, and in some cases a foreign body may be detected even with the finger.

Tumors of the larynx and trachea are usually polypoid, although many other kinds are met with in this location,—papillomata, fibromata, cystic tumors, myxomata, lipomata, angiomatica, and sarcomata. They are of slow growth, and the voice is affected for a considerable time before the breathing. They are easily distinguished from the acute diseases of the larynx, but an examination with a mirror is absolutely necessary for a differential diagnosis between each other.

There is a large number of diseases which interfere with respiration by *external pressure* upon the air-passages, and their most characteristic symptom is an increase of the dyspnœa when in the horizontal posture. Retro-pharyngeal abscess and tumors and foreign bodies in the œsophagus have been considered. In *suppuration about the larynx* the symptoms simulate a retro-pharyngeal abscess,—the orthopnœa, the rattling, stridulous inspiration and comparatively noiseless expiration, the voice and cry hoarse, the cough rough but without clangor, and the pain on deglutition with possibly the return of the food through the nose and mouth. It differs from the fact that no pharyngeal swelling can be detected even by the finger; the larynx may be prominent or pushed out of the mesial line, and there is some swelling in its neighborhood, which feels more as if it contained air than fluid. It is an acute disease and runs a short course. External pressure upon the air-passages may be made by any of the following diseases, but their diagnosis presents no special difficulties: erysipelas and phlegmons of the neck from various causes; cervical

tumors ; tumors and phlegmons in the posterior mediastinum ; enlarged lymphatic glands ; aneurisms ; and tumors and hypertrophies of the thyroid gland and of the thymus gland. This may also occur in *dislocation of the clavicle* backward at the sterno-clavicular joint, which may be the result of violence, or has occurred spontaneously in connection with the chest-deformity of vertebral caries and of rotary lateral curvature of the spine. In *empyema* the trachea may be so greatly obstructed that both expiration and inspiration is impeded. This occurred in a patient of Dr. Joseph O'Dwyer's, which I had the pleasure of seeing. Both respiratory sounds were loud and croupy, and there was extreme dyspnoea. All these symptoms immediately disappeared upon removal of the pus from the chest, and the child made a good recovery.

Pressure upon the pneumogastric or its recurrent branch by enlarged bronchial glands is characterized by spasm, but is always preceded by some time by hoarseness and paroxysmal cough. Dr. J. Solis-Cohen says that the epiglottis is apt to be incarcerated in the larynx during the most violent paroxysm of spasm of the glottis, and that suffocation may be thus produced. It can be detected by a digital examination. The peculiar hiccoughy respiration of *chorea of the larynx* and the loud whooping inspiration of *pertussis* require only to be mentioned.

In *fracture of the larynx* the history of an injury may give valuable aid, but a positive diagnosis can be made only when crepitus and motion of the fragment is detected. An examination should always be made with the finger passed over the dorsum of the tongue. Locally there is severe pain on pressure, and swelling due both to emphysema and infiltration of blood and serum. Ecchymoses may appear. This injury is associated with great pain on speaking, on swallowing, on moving the tongue, and on opening the mouth. The articulation is indistinct and the voice may be hoarse or absent. There is marked dyspnoea, which is increased on protruding the tongue, and death may be due to suffocation. If the mucous membrane be pierced by one of the fragments, there will be a hemorrhage and bloody expectoration. In *paralysis of the abductor* muscles of the glottis, inspiration only is ob-

structed. It is almost exclusively a sequel of diphtheria, and in young children may produce asphyxia in a very short time.

OBSTRUCTION IN THE BRONCHI.

In the respiratory diseases located in the bronchi and in those which cause pressure upon the bronchi there is, as a rule, greater obstruction to expiration than to inspiration. Again, the respiratory sound is diminished only on the side to which the obstructed bronchus goes, while, on the other hand, when the obstruction is above the bifurcation of the trachea, the respiratory sound, although diminished, is of equal intensity on both sides.

The wheezing respiration of some forms of *bronchitis* and *œdema of the lungs*, which can also be detected by placing the hand on the back, should be easily made out. *Chronic emphysema* is very apt to be accompanied by a wheezing breath-sound, a husky cough, and attacks of dyspnoea which are asthmatic in character. This emphysema is more probably the result of the asthmatic attacks, which in children, almost without exception, are not primary, but depend upon other conditions, in most cases a chronic interstitial pneumonia or enlarged bronchial glands. The chest is distended in the upper regions, and there is hyper-resonance on percussion. The area of cardiac dulness is diminished, and the liver may be displaced.

There is both an *acute* and a *chronic membranous bronchitis*, and when confined to this location a positive diagnosis can be made only when bronchial casts are coughed up, although, when the membrane becomes loose, a peculiar squeaking or flapping respiration is heard.

In *spasmodic asthma*, which in the pure form is rare in children, there is marked dyspnoea during the attack, and it is characterized by an excited action of the muscles of respiration, with heaving of the chest; but the obstruction is on expiration, and the recessions of the soft parts of the chest during inspiration are absent, and the chest remains fully distended and moves but slightly during each breath. There is a marked spasmodic element, and the severity of the suffering is out of all proportion to the physical signs. The expiration

is prolonged and laborious ; there is but little increase in frequency of the breathing ; there is no laryngeal stridor, and the temperature is normal. The cough is short and dry, but not paroxysmal. It is often the result of whooping-cough or catarrhal pneumonia ; the child usually suffers from pulmonary emphysema, and the attack occurs as a consequence of a fresh catarrh. There are very few cases in young children in which direct pressure upon the bifurcation of the trachea or a main bronchus can be excluded.

Enlargement of the bronchial glands is not rare, according to Eustace Smith. These glands are situated at the bifurcation of the trachea, behind the upper bone of the sternum and a little below it, and also accompany the bronchi into the interior of the lung. They may cause considerable disturbance by pressure upon the blood-vessels, the air-passages, and the nerves of the chest. Evidences of pressure upon the vena cava or either innominate vein is shown by some lividity of the face, epistaxis or hemorrhage from the lungs, and prominence of the superficial veins of the temples, neck, and front of the chest. This pressure causes a venous hum, and, if the glands are not sufficiently enlarged to press upon the vein, it can be induced by throwing the head backward, if the glands are movable. Pressure upon the nerves is shown by hoarseness and a paroxysmal cough which resembles pertussis. Pressure upon the trachea produces a more or less spasmodic dyspnoea, which may be intense, occurs most frequently at night, and usually follows a catarrh or cold. There is an expiratory stridor, which is generally intermittent. When the glands are in contact with the chest-wall there will be dulness over the first bone of the sternum, which may extend for some distance on each side and below. Auscultation gives a very characteristic loud, blowing sound, produced by transmission from the bronchi through the glands. It is most marked at the apices of the lungs, although it may be heard loudly over the whole of one or both sides of the chest. It is less high-pitched and metallic than the sound heard in cases of pulmonary consolidation and excavation, and upon opening the mouth it is generally modified in intensity or may disappear entirely.

When a *foreign body* gets into the bronchi there is usually

a sudden attack of dyspnoea and spasmodic coughing, and there may be periods of comparative comfort between the paroxysms. It is marked by expiratory obstruction, a fixed pain referred to some part of chest, often an inability to lie upon one side or the other because it increases the dyspnoea, and a cough which resembles pertussis, and may be accompanied by a peculiar clicking noise. The respiratory murmur is diminished or suppressed upon one side, and the physical signs are those of collapse or surgical emphysema. It may result in a catarrhal pneumonia, gangrene of the lung, or a chronic phthisis.

DISCUSSION.

DR. J. HENRY FRUITNIGHT.—I wish to emphasize the significance of hoarseness of the voice to which the author has alluded. I regard hoarseness, and even huskiness of the voice in children, as a warning of danger. In my experience it is often a premonitory symptom of impending serious laryngeal stenosis, and hence the physician should be on the alert, when it is present, lest by inattention the patient might develop a possibly fatal attack of laryngitis.

DR. A. CAILLÉ.—Dr. Brown has mentioned most of the causes of this condition, but he has not referred to acute pulmonary oedema. In some forms of heart-disease we may have acute oedema, which develops within five or ten minutes, giving rise to very characteristic noisy respiration.

DR. FRANCIS HUBER.—I should like, in this connection, to mention the case of a child six or seven years of age, to which I was called to intubate. The child had received about eight grains of iodide of potassium in the course of a few hours. The stenosis was sufficient to be quite alarming. There was also considerable coryza and swelling of the eyelids. I advised delay, and in a short time the stenosis grew less and disappeared in about three days. In this case the child was extremely susceptible to the action of iodide. Partial swallowing of the tongue is not at all infrequent. I have seen three instances in children much run down, and who when allowed to rest on their back would have considerable difficulty in breathing. When the children were placed on their sides the difficulty at once disappeared.

DR. W. L. CARR.—I might mention the case of a young girl admitted to St. Mary's Hospital who had marked hysterical manifestations. She had very noisy expiratory sounds, and was very troublesome for a time. If spoken to sharply,

the noise would cease, but would soon begin again. She finally did well under the use of arsenic. This case was regarded as a case of localized chorea involving the muscles supplied by the recurrent nerve.

GENERAL SUBCUTANEOUS EMPHYSEMA.

BY CHARLES WARRINGTON EARLE, M.D.,

Chicago.

ON the 26th of November, 1888, through the kindness of Dr. R. H. Kenning, I was called to see Homer Jones, aged three and a half years. He was, and had been for one week, very sick with catarrhal pneumonia. This pneumonia was not, as is frequently the case, secondary to any disease, but had developed as an ordinary cold, until finally it culminated in the disease with which I found him suffering. It is of course possible, perhaps I should say, in view of subsequent events, entirely probable, that there was a little pleuritic complication. But there was no effusion of any consequence, and, even if something of a pleuritic nature had existed, the treatment would not have been changed. The boy progressed satisfactorily, without material change in treatment on my part, till December 10, when I was hastily summoned, with the intelligence that the little patient was enormously swollen.

Upon visiting the case I found that the urgency of the call had not been exaggerated. The subcutaneous tissues of the forehead, cheeks, neck, and of the entire trunk anteriorly to Poupart's ligaments, and posteriorly to the iliac crests, were filled with air.

The child looked as if he would float on water. The respirations were hurried, the pulse moderately rapid, and the face, in addition to its peculiar appearance, had a worried and anxious look. It was not at all difficult to see that we had here a case of very general subcutaneous emphysema. It made its appearance in the neck at first, and rapidly extended to every other part of the body except the scalp and legs. I had never seen anything comparable to it before. I had noticed

a local and always insignificant emphysema after two or three tracheotomies and in a few surgical cases, more particularly in the extremities. A few trivial cases, always local, had engaged my attention, but nothing compared with this.

Acting entirely upon my own judgment, and without precedent, I bandaged the child from its feet to its chin, and administered a stimulant and supporting treatment. The child at times seemed to improve, but at last began to show signs of exhaustion, and died on the tenth day after the appearance of the complication.

The propriety of puncturing the skin in different places was discussed, but it was thought that it would add an additional danger,—the possibility of infection,—and the measure was not employed.

I must now add, with deep regret, that no autopsy could be obtained. Every argument possible which was at all honorable was brought to bear on the mother, but to no avail; under no circumstances would she allow it.

And now, what is the state of our knowledge concerning this disease, or this complication of other diseases. We shall find that the majority of text-books on diseases of children are remarkably silent regarding the subject. Although Latour, in his "*Manual on Croup*" (1808), mentions a case of great dyspnoea in a child, caused by a rupture between two tracheal rings, it is not clear that emphysema followed. But it is cited in close relation with Bourgeois's observation, which is directly to the point. In the case of a girl, twelve years old, on the seventh day of croup, there was heard, after a violent attack of suffocation, a noise in the breast of the child, as if a rupture had taken place. After this, emphysematous swelling and death followed, but no rupture in the bronchial tubes could be found at the post-mortem. Rauchfuss says a less frequent, and in its extreme degrees very rare, sequela of stenosis of the upper air-passages is interlobular and subpleural emphysema, which may spread as mediastinal and subpleural emphysema, and finally into the subcutaneous variety.

Steffen, to whose works I have not had access, has probably written as voluminously as any author upon the general subject of emphysema. Whether he speaks to any extent regarding

the variety we are considering I do not know, but probably not, as in another part of my paper it will appear that only three or four cases of complete subcutaneous emphysema from lung complications have ever been recorded. He, however, does cite one case caused by a foreign body (a bean in the bronchi), which subsided after the latter's expectoration.

Fürst (Gerhardt's "Handbook") goes over the entire field of all forms of the disease we are considering, but says little concerning the subcutaneous variety, except that it may occur from rupture of the alveolar variety,—becoming subpleural, then mediastinal, and then subcutaneous. All the arguments for and against emphysema being a disease in itself are carefully considered, and the various theories as to its etiology and pathological anatomy brought out.

It is only during the last half of the present century that particular reference to emphysema as a children's disease has been studied. Perhaps the most important fact established is, that in children an ordinary or vesicular emphysema is more amenable to treatment than in adults. The pathological condition is not so pronounced. In adults the elasticity and rarefaction of tissue is plainly marked and the prognosis unfavorable, while in children, with the removal of the cause, recovery is to be expected. Lung-tissue in children has not the tendency to atrophy that we find in adults. There are those, however, who believe that from the yielding alveolar and thoracic walls of children these subjects are extraordinarily predisposed to the different forms of pulmonary emphysema. Steffen particularly places great importance on this point.

Although it is confessed by all authors that subcutaneous emphysema is very rare, yet as a form it finds its place in the best classifications.

Fürst's classification is as follows:

1. Vesicular or alveolar,—alveolar or infundibular.
2. (a) Within the pleura: interstitial, interlobular, subpleural. (b) Without the pleura: mediastinal, peribronchial, subcutaneous, involving the thorax, neck, and face, and in some cases becoming general.

To this might be added those emphysemata which may arise as complications or sequelæ to other diseases, or more

particularly to surgical operations. In this class we will find our cutaneous form, particularly the partial variety, with greatest frequency.

With all these varieties of emphysema it would be expected, perhaps, that our standard authorities on diseases of children would at least mention the pulmonary forms. The excuse may be given—and I do not criticise their judgment—that it is such a rare disease that it hardly merits the space necessary.

The following authors on pediatrics, to whom I have easy access, say absolutely nothing regarding subcutaneous emphysema,—viz., Starr, Jacobi, Steiner, Meigs and Pepper, Hillier, Day, Ellis, Goodwin, Owen's "Surgical Diseases," Stewart, Gooch, Dewees, Underwood, Eberle, Goodhart, Henoch, Duncan, Meadows, Smith, West, Barthez, and Ralliet. I find nothing in four or five volumes of the Archives of Pediatrics. Condie, however, speaks of a case in which everything was favorable for a cutaneous emphysema, but whether it was produced he does not say. A child swallowed a metal button, which lodged in the right bronchial tube. In the course of a few weeks it developed pneumonia in both lungs, which was followed by subpleural emphysema. From Vogel, who evidently was acquainted with the disease under consideration, I quote the following: "Sometimes they (air-bubbles) circumscribe a pulmonary lobule, in the shape of an island, and, when the interlobular emphysema has developed itself between many neighboring lobules, form large air-bubbles, which may be pushed hither and thither over extensive portions of the pleural surface of the lung. The escape of air into the connective tissue surrounding the bronchi into the mediastinum anticum, and thence out upon the neck and breast, is a very rare occurrence. These instances almost invariably terminate fatally."

From Pepper ("System of Medicine") I find the following: "Emphysema, from the presence of air in the connective tissue, under the skin, is rarely met with, except as the consequence of an injury or of local gangrene."

Fraentzel, in speaking of the treatment of pneumothorax (Ziemssen, vol. iv., p. 770) by capillary puncture, says, "If we are not careful about this, then air passes out of the pleural

cavity in coughing, enters the canal made by the puncture, and thence passes into the subcutaneous connective tissue. The cutaneous emphysema which is thus produced sometimes spreads with remarkable rapidity over the greater part of the body, and proves most distressing to the patient."

In this connection we quote the following case from *The Lancet*, February 2, 1889. A child, eighteen months old, had broncho-pneumonia. Aspiration was attempted, followed in two hours by subcutaneous emphysema. In eight hours it reached its maximum, involving the whole trunk, but not the arms or legs. It completely disappeared in two weeks. About two weeks later the child died unexpectedly from diphtheria. In relation to the emphysema, the autopsy showed that the aspirating needle had probably entered one of the dilated tubes; consequently, as the two pleural surfaces were firmly adherent, and the walls of the dilated bronchus rigid, a track was left leading direct from the main air-passages to the subcutaneous tissues, into which air was easily pumped by the slight cough that followed the puncture.

In Rokitansky there is the general statement that cutaneous emphysema may follow perforation of the larynx by ulcers, and Wilks reports a case. A boy, twelve years old, with typhus, had an emphysematous swelling on his neck on the twelfth day, which spread over his face, breast, and arms. Death followed in ten days. Post-mortem revealed perforating laryngeal ulcer.

In the chapter on "Rupture of Oesophagus" (Ziemssen, vol. viii., p. 94) occurs the following sentence: "In a diagnostic point of view a very important symptom is the almost constant appearance of a rapidly-developed emphysema of the skin, which, appearing first on the neck above the clavicles, soon extended over a large area, and sometimes involved the whole surface of the body."

Subcutaneous emphysema may occur as a consequence of gastric ulcer. The gas is generated in the stomach, and contains hydrogen, as it burns with a blue flame. The gas may enter the subserous tissue at the edges of the ulcer and thence spread, or, after perforation of the stomach, it may make its way from the peritoneal cavity into the loose subserous con-

nective tissue through some place in the parietal peritoneum which has been macerated, perhaps, by the digestive action of the gastric juice.

Professor Welch (Johns Hopkins University) brings this out fully in his article in Pepper. He gives to Roger the credit of first calling attention to this fact, and cites a number of authorities who may be consulted, if one wishes to investigate the subject further. (Pepper, vol. ii., p. 509, footnote 3.)

Regarding the local emphysema which sometimes takes place after tracheotomy, E. Bartel believes that it is due to the sudden and forcible entrance of air into the alveoli subsequent to stenosis when the tracheotomy is performed, vesicular emphysema being produced first, then interlobular, mediastinal, subpleural, and then cutaneous. Rauchfuss believes the emphysema complicating tracheotomy is due to air entering the cellular spaces through the wound from without, and he has known it to occur before the trachea has been opened. The order in which the disease takes place is generally conceded to be, first, interlobular; second, subpleural, and extending to the base of the lung; then mediastinal, followed by intermuscular, and then subcutaneous.

Dr. Baudey, of Lille, speaks of emphysema of the eyelids and orbit, in which the air in the nasal fossæ passes into the cellular tissue. Emphysema in this location taking place after an effort in clearing the nose or sneezing is usually the result of a fracture of one of the bones in the internal orbital wall. Under certain circumstances a so-called spontaneous emphysema results from rupture of the nasal duct, produced by surgical traumatism. In such a case a fracture is not necessary. In very rare cases this form of emphysema is attendant upon defective developments of the parts in question.

A peculiar case of traumatic emphysema is reported by Paucin. He found a considerable swelling of a portion of the thigh, the scrotum, lumbar region, and lower part of abdomen, in a laborer, who said that, in punishment for some supposed injury done to them, two of his companions held him, while a third made a small incision in the inner surface of the prepuce, introduced a small tube into it, and blew in

air. An examination disclosed a small ragged wound three millimetres in length at the point indicated.

Dr. Luoff reports three cases of emphysema occurring during labor, one of which came under his observation.

A few cases of general cutaneous emphysema are on record following abdominal section.

Prof. H. M. Lyman narrates the following important case : "A man, aged forty-five, in a drunken fight, was kicked in the trachea with the toe of a heavy boot. Was seen the following day, and found to be emphysematous to the groins. No other very marked symptom. Gradual recovery. The swelling and crepitation entirely disappeared without active treatment in the course of a few days."

Perhaps the most interesting case on record of cutaneous emphysema is found in *Archiv f. Kinderheilkunde*, vol. viii., 444, by Dr. Franz von Torday, university of Budapest. A three-year-old boy, well developed for his age, was taken ill with diphtheria of both tonsils on November 6, 1883. His parents were healthy, but the hygienic surroundings were not the best. The treatment consisted in soda salicylate internally, and iodoform and glycerin locally. On the fifth day symptoms of laryngeal invasion were present, and there was evidence that the lungs were becoming congested to an alarming degree. His weakness was also increased by a severe diarrhœa of a watery character. In spite of the most careful nursing and treatment the patient continued to grow worse. Professor Bakai, in consultation, pronounced the case unavoidably fatal in a few hours, as the stenosis had reached the highest possible point, respiration being confined to the upper portions of the right lung, where even it was mingled with rattling and piping sounds. At 9 P.M. the patient was comparatively quiet, resting with outstretched neck in a semi-recumbent position in its mother's arms; lips cyanotic, extremities cold, face and trunk covered with perspiration, and eyes dim. November 13 I called on the family, expecting to find the child dead; to my great surprise I found him asleep, sitting in a vapor-bath. Respirations 40 to 50 per minute and the pulse a little faster, 160 to 180, but also stronger. Breathing and piping sounds could now be heard in the upper portion

of the left lung, not lower than the fifth rib, but not in the lower portion of the right lung.

On the right side, between the vertebral border of the scapula and the spines, there was a triangular swelling, size of a hen's egg, soft, elastic, and cushion-like to the touch. The edges of the swelling were puffed out, and the skin covering it showed scarcely any change in color or consistency. No one had noticed the appearance of this subcutaneous emphysema.

During the following twenty-four hours there was no material change in the disease. But the subcutaneous emphysema quickly spread over the right side of the neck towards the front. It progressed so rapidly that already, on the first day, it had so far covered the face that the eyelids, especially on the right side, had swollen into small cushions, and completely covered the eyes. The emphysema then went to the head, and during the following three days it invaded the chest, back, arms, and hands to the finger-nails, and the trunk to the pelvic bones.

The external medication was continued and inhalations of bromine vapor ordered. Nothing was given internally, because it was refused. Therefore quinine was injected in clysters of strong beef-broth and yolks of eggs. From November 14 to 17 the temperature hardly rose above 38° C. On the 17th improvement began. Retrogression of the emphysema was constant, uniform, and lasted eight days.

November 28, emphysema had entirely disappeared. Respiration remained harsh for a time, but in a month's time the respiratory organs were restored to their normal condition. It took a year, five months of which were spent in the country, to dispel the hoarseness.

This case is interesting on account of the severe subcutaneous emphysema which nearly covered the whole body, and therefore may be called complete. There is scarcely a doubt that the origin of the emphysema was from rupture of the pleura at the root of the lungs. The rupture was the result of increasing diminution in respiratory surface, associated with forced breathing and spells of violent coughing. The air escaping from the lung entered the posterior mediastinum, and

rapidly dissected its way upward into the more open connective tissue, and then under the skin.

So severe and almost complete subcutaneous emphysema, under circumstances like those related above, occurs comparatively seldom in children, and in most cases has a fatal termination. The possibility of the occurrence of subcutaneous emphysema is sometimes alluded to in text-books and periodicals, but I have found only a single case in the literature of the profession which was observed and thoroughly presented. This case, observed by Sachse (*Virchow's Arch.*, lii., p. 148, 1871), seems very much like mine. Here, too, pharyngeal diphtheria was the existing disease. Under treatment the breathing became easier, and yet on the fourth day there appeared subcutaneous emphysema, which spread over the neck, face, and thorax, ending fatally on the second day. At the post-mortem the anterior mediastinum was found distended with air. The upper portions of the lungs were in a high degree emphysematous, while the lower portions were in a condition of acute inflammation.

I have not found another case in literature where so widespread emphysema followed diphtheria, or where it was attended with diseases of the lungs.

Monti (*Jahrb. f. Pädiatrik*, 1872, ii.), Steffen (*Klinik d. Kinderkrankh.*), Fürst, Hertz, and others, who have thoroughly studied emphysema of the lungs in children, are generally of the opinion that subcutaneous emphysema in children is very rare, and when found, results from catarrhal pneumonia, capillary and croupous bronchitis, and especially pertussis. In these cases the air passes from the lungs through the ruptured interlobular connective tissue into the mediastinum, and thence to the neck and under the skin. In most cases the disease has been fatal.

Recapitulations.—Subcutaneous emphysema is either local or general. As a local difficulty it is found after operations in the vicinity of and involving the respiratory tract. It occurs after tracheotomy, and by some writers is believed to take place before if the stenosis is very pronounced. It may follow puncture of the chest in the treatment of pneumothorax, and is found around and involving the cellular tissue of the eyes,

caused by exaggerated expiratory efforts, producing a fracture of one of the bones in the internal orbital wall, or from rupture of the nasal duct. A local emphysema may also be produced by the introduction of air through a tube into loose subcutaneous tissue.

General or complete subcutaneous emphysema is rare in children; and from the fact that the causes which produce it in the young are generally not present to the same extent in adults, we may conclude that this form of emphysema is very rare among those who have reached advantage.

The etiology of subcutaneous emphysema in children is interference with or obstruction to respiration, as we find it in catarrhal pneumonia, capillary bronchitis, pertussis, croup, and diphtheria. It may arise from perforating laryngeal ulcerations, from rupture of tracheal rings either by force or the results of disease, from rupture of oesophagus, and as a consequence of gastric ulcer.

The prognosis is good, unless the preceding disease has brought about great depression and asthenia. In weak children, with a grave malady which in itself taxes the recuperative faculties of the system, a fatal result may be expected.

Treatment.—Nature sometimes effects a cure by a circumscribed pleurisy or by a gradual narrowing in the opening. The means at our command are limited. What surgery will do in the future for its relief is not at this day known. We should puncture the skin in the most prominent emphysematous places, using every antiseptic precaution, bandage the body in the most complete manner possible, and sustain the strength and vitality of the patient by every means at our command.

DISCUSSION.

DR. FRANCIS HUBER reported the case of a child eighteen months old, in which general emphysema followed a low tracheotomy. Death about twenty hours later. In another case emphysema followed immediately on the withdrawal of the needle in a case of aspiration. Was positive that the lung had not been injured, for the needle moved freely in a cavity, and over a pint of pus was readily drawn off. An incision was then made into the pleural cavity and a drainage-tube inserted. Three days later a slough of lung-tissue came away.

The case ultimately made a good recovery. When a small opening is made in empyema there is danger of localized emphysema occurring, necessitating the enlargement of the incision to prevent the air infiltrating the connective tissue.

DR. J. HENRY FRUITNIGHT had not met with this accident in children, but gave the details of a case occurring in an adult, in which the ends of a fractured rib punctured the lung and was followed by emphysema of the thorax on the left side.

THE PRESIDENT had seen several cases, but none so extensive as that reported by Dr. Earle. Some occurred in tubercular phthisis with pneumothorax; many in cases of croup. Most of these were antefacts, that is, the emphysema was the result of a lesion of the mediastinal connective tissue, when tracheotomy was performed below the thyroid. Most of these cases were seen in his early practice, and were avoided in later years. A spontaneous case of emphysema during the intense dyspnœa of croup was relieved by tracheotomy, which freed the mediastinum of its emphysema, or rather prevented its increase.

DR. EARLE asked why the emphysema always stopped at Poupart's ligament. Why not puncture in several places?

DR. W. L. CARR thought that the limitation of the air above Poupart's ligament was due to the peculiarity of the attachment of the fascia at that point. The deep layer of the superficial fascia is bound down by a thin but dense intervening layer of fibrous tissue along the whole length of Poupart's ligament.*

DR. FRANCIS HUBER, in considering the propriety of puncture in emphysema, would be guided by the indications of the individual case.

MEMBRANOUS CROUP (LARYNGO-TRACHEITIS) IN A GIRL TWELVE YEARS OLD—TRACHE- OTOMY—RECOVERY.

BY A. CAILLÉ, M.D.,
New York.

ON July 1, 1889, I was requested to intubate in a case of laryngeal stenosis. I found my patient, a girl of twelve, sitting upright in bed, with moderate dyspnœa, slight cyanosis,

* "Quain's Anatomy," eighth edition, vol. i., p. 314.

rapid pulse. Temperature, 100° F. Cool and pale skin. Submaxillary gland could be felt on both sides; there was no visible membrane in the nose or pharynx, and the mucous membrane of the pharynx was unusually pale. The patient's voice was husky, and a short, dry, croupous cough could be heard every few minutes. Palpation with the index-finger revealed a stiff and thick epiglottis and a marked flattening of the funnel-shaped laryngeal entrance. It was reported by the parents of the girl that she had been under treatment for eight or ten weeks for chronic laryngeal catarrh, that two cases of diphtheria had developed in the same house, and that the girl had been removed to her present quarters to avoid complications.

An examination with the laryngoscope was attempted, with unsatisfactory result, owing to the marked dyspnoea. As a result of our careful examination, I did not hesitate to corroborate the diagnosis of the attending physician, who had pronounced it a case of membranous croup, which is quite rare at the age of twelve.

Operative interference was postponed because the dyspnoea was not urgent, and because it is not unusual for older children to recover after mercurial treatment and proper inhalations. Minute doses of bichloride of mercury were ordered every half-hour in a watery solution containing a small dose of wine of ipecac. A continuous spray containing eucalyptol-turpentine was kept up during the night.

At six o'clock the following morning a choking spell set in, and a piece of membrane was coughed up, somewhat thicker than blotting-paper, three inches in length and half an inch in width, smooth on one side and sanguineous on the other.

Auscultation showed little respiratory murmur in the left lung. During inspiration a short "flap" sound could be heard, which I believed to be due to a partly-detached membrane. There was good murmur in the right lung.

After the expulsion of this membrane respiration became very free, and the girl asked for food. Towards noon the same day the stenosis became urgent, and at 3 P.M. I performed tracheotomy for its relief. The thyroid gland was found large and located high; the original incision was then

carried downward, and the trachea opened below the thyroid gland, with a view of affording the greatest possible access to the lower trachea. After opening the windpipe the latter was illuminated by means of a head-mirror, and the thick membranous lining removed from above and below the line of incision. Good breathing was at once established, and a large-sized tube finally introduced. On the day following the operation the body temperature rose to 102°, 103°, 104° F., and this febrile condition persisted for a week. During this time expectoration was at times profuse and at other times it ceased completely. A continuous spray was absolutely necessary to insure comfortable breathing, a salt-water spray being the most acceptable to the girl, who was intelligent and a good observer of her condition and symptoms.

Sudden and severe attacks of dyspnoea came on several times each day, due to obstruction by membranes or thick mucus in the lower trachea. These choking spells were so distressing that it became necessary to drop salt water directly into the trachea in quantities of ten to twenty drops at a time and at regular intervals. By such means the membranes were loosened and expelled, and several hours of good breathing secured. On three occasions during the night I was obliged to remove the tube and await the expectoration of an obstructing membrane before reintroducing it. This bottle contains some of the membranes thus expelled.

After a week of anxiety as to the final result, the temperature became normal, and the expectoration became thin and slightly sanguineous. Good breathing was established in both lungs, with abundant moist râles. On the tenth day the temperature rose again to 103° F., marking the onset of a purulent bronchitis, which lasted a week. The tube was removed on the fourteenth day, and two weeks later the somewhat large and gaping wound had closed, and the girl passed from my observation in good health, with a perfect respiration and slightly husky voice.

In closing this report I would state that I have operated sixty-five times for laryngeal stenosis in children under seven years of age, and that this is the first time I have observed a membranous stenosis in so old a child. In choosing between the

two operations, tracheotomy and intubation, I chose the former as affording, in my opinion, the best chances of success in so grave a case, in which the symptoms before operation pointed to the probability of massive membranous deposits in the lower trachea,—a well-founded supposition, as shown by the subsequent experience in the case.

DISCUSSION.

THE PRESIDENT said that the disease was rare at this age, and that he had operated only once on such a case. The girl was thirteen years old, and died some weeks after the operation of general sepsis and gangrenous destruction of a large part of the anterior wall of the trachea.

DR. J. O'DWYER remarked that tracheotomy should be tried when intubation fails. In an experience of two hundred and fifty intubations he had performed this operation on two children of this age.

DR. FRANCIS HUBER.—The oldest child intubated was eleven years of age. He advised the use of a smaller tube, as each expulsion of the tube is followed by casts. In fact, would resort to "intermittent intubation," a plan advocated in an article which appeared in the ARCHIVES OF PEDIATRICS in January, 1889.

DR. DILLON BROWN said that it was, in some cases, easier to remove loose pieces of membrane after intubation than after tracheotomy. The O'Dwyer tube not only acted as an irritant but enabled the patient to obtain a more expulsive cough than tracheotomy did. He related a case illustrating this point, and referred to a number of cases in which more than one piece of pseudo-membrane had been expelled through the natural air-passages after intubation. In one case there were seven complete casts coughed up, many of them having one or more branches.

DR. H. N. VINEBERG asked what the object was of intubating when the stenosis was in the trachea and bronchial tubes. If the tube in the larynx merely excited expulsion of the membranous casts of the trachea and larger bronchi, would not some other simpler method of intubation be just as efficacious?

THE PRESIDENT would have done as Dr. Caillé did. He had been converted to a belief in the value of intubation, but where the membrane was below and where the croup was ascending tracheotomy should be employed. He recalled twenty or thirty cases of fibrinous bronchitis termi-

nating in diphtheritic tracheitis and laryngitis. In these cases, when this ascending form of croup reaches the larynx, cyanosis sets in very rapidly, and as a rule tracheotomy yields but little relief, if any. Still it ought to be performed, furnishing the only way in which access to the pseudo-membranes can be had.

JANICEPS ASYMMETROS.

BY A. CAILLÉ, M.D.,

New York.

THROUGH the courtesy of Dr. Holcomb, of New York City, I have the opportunity of presenting this monster, which in the text-books is described as a synkephalus. It is formed by the fusion of two bodies. In this specimen it is an asymmetrical synkephalus, having one head, four lower and four upper extremities. The thorax is double; the vertebræ from the pelvis up are double; the umbilicus is single. The viscera have not as yet been examined; but in similar cases, reported in Ahlfeld's book, and pictured on Plate XV., Figs. 1 and 2, the stomach and œsophagus are usually single, the kidneys and genital organs double. The thorax may be single or double, and the thoracic contents in accordance. The cerebrum is usually single; the cerebellum, medulla, pons, and corpora quadrigemina double.

Dr. Holcomb reports that the janiceps asymmetros here presented was a vertex presentation, born without difficulty, and lived a few hours. It was the sixth child of healthy parents, all the previous children being normally developed.



JANICE'S ASYMMETROS.



JANICE'S ASYMMETROS.

A CONTRIBUTION TO THE STUDY OF THE
SUMMER DIARRHŒAS OF INFANCY.*

BY JOHN A. JEFFRIES, M.D.,

Boston.

BEFORE entering into the details of this paper it is necessary to define briefly the range and scope of the subject. Every physician is familiar with the summer diarrhœas and the generally accepted belief that heat and fermentation are at the bottom of the trouble. No common standard of classification, however, is in vogue: some call everything cholera infantum; others gastro-duodenal catarrh, summer or green diarrhœa. Some deny that the symptoms give a proof of the *locus morbi*; others speak of gastritis, catarrh of the small intestine, colitis, proctitis, follicular enteritis, and the like. Others, yet again, say that the diarrhœa is only a symptom, and that we must look to other organs for the foundation of the disease,—for instance, the splanchnic ganglia.

My own observations lead me to agree with those who hold that, ruling out syphilis, tuberculosis, typhoid and other specific diseases, there remains a vast number of cases characterized by diarrhœa, vomiting, wasting, often fever, which occur chiefly in hot weather. It is these cases which are intended to be included under summer diarrhœa. They form a group or genus with few definite species of disease, but a great number of forms, no two exactly alike, yet so closely running into each other, and forming series, as to preclude all possibility of a reasonable separation. All show more or less signs of catarrh of the alimentary canal in one part or another, generally the whole. But this catarrh expresses itself, or is accompanied by a variety of symptoms. Diarrhœa is the rule, but constipation may take its place. In color the stools are brown, black, yellow, red (from blood), or most often green. The amount of

* The bacteriological work of this paper was done in the laboratory of the Harvard Medical School, for the liberty of which I am much indebted. This paper was written in January, 1889.

water is very variable, but mostly in excess; in odor they follow the whole gamut of fermentations and putrefactions. Gastric disturbances, as indicated by vomiting of undigested or fermented food, follows closely after the diarrhœa in frequency, while wasting, abdominal tenderness, fever or subnormal temperature, alterations in the urine, and variable nerve-symptoms bring up the rear.

Anatomy and physiology.—The alimentary canal of the infant is not like the adult's, though built on the same plan. It is therefore desirable to consider the variations from the adult organs. In the mouth are to be noted the absence of teeth during the first months of life, and then their growth; also the dryness of the whole cavity. This dryness is due to the scanty supply of saliva, which is also lacking in saccharolytic powers. The œsophagus offers nothing of note. The stomach varies materially from that of the adult. It is very small, even down to thirty-five to forty-three cubic centimetres at birth, growing rapidly to one hundred and fifty-three to one hundred and sixty at two weeks, and about seven hundred and forty cubic centimetres at two years (Beneke).* In shape it lacks the cardiac enlargement, and is proportionately smaller along the greater curvature, which, by the bye, looks forward rather than down. Thus, as the infant lies chiefly on its back, the so-called posterior surface must form the true floor of the organ. The stomach walls are thin at the expense of the muscular layers, the submucosa well developed, and tending to a liberal supply of round cells. The epithelium proper is nearly that of adults, and varies only in the smaller glands, delamorphic and adelamorphic cells being present (Baginsky).†

The chief elements of gastric digestion—pepsin, hydrochloric acid, and milk ferment—are represented, but less in quantity than in adults.

Lastly, Leo has found, as the result of examining thirty healthy infants, that the fasting stomach is always acid; that a considerable amount of the milk, especially if breast-milk, has left the stomach in an hour; that during its stay in the

* Beneke, *Deutsch. Med. Wochens.*, 1880, p. 433.

† A. Baginsky, *Virchow's Archiv*, vol. lxxxix., p. 64.

stomach the milk slowly takes up the acid, so that but little free acid is left.

The intestines are described by Baginsky—with whose observations my own on young animals agree—as having but a thin muscular layer, and a poorly developed mucus layer,—that is, the villi, crypts of Leiberkuhn, and Brunner's glands are only partly developed and few in number. On the other hand, the follicular and lymphoid tissue of the intestine is well developed, and occupies a more prominent position than in the adult. These differences point to less chemical action on the part of the intestine and more absorption than in the adult, conditions to be referred to later.

The ratio of the length of the intestines to the body is greater in infancy than in adult life; thus, 57 : 10 at birth, 66 : 10 at two years, almost 47 : 10 at thirty years. (Beneke.)

The pancreas is slow in assuming its functions, and develops *pari passu* with the salivary glands. The liver offers little difference in structure, is variable, but large in size. The bile, however, according to recent investigations,* is remarkable for the small amount of the inorganic salts, except those of iron, cholesterin, fat, lecithin, and bile acids; glycocholic acid is absent.

Glancing over these differences, it is clear that the digestive tract must lack muscular power; the stomach is not prepared to do much churning, or the intestines to pass on heavy solid material. The chemical side of digestion is also weak; the stomach is known to be less active, and the same must be true of the intestines, with poorly developed glands and the less active liver and pancreas. Absorption, on the other hand, would seem to be very good, judging from the relative length of the intestines and the advanced development of the lymphatic system.

These differences amply explain why the diet of infants should be so limited, and that even cow's milk, diluted, produces fæces abounding in proteids, as shown by Biedert.†

Pathology.—The pathology of summer diarrhœas is by no

* Jakubowitch, *Jahrb. f. Kinderheilkunde*, 1886, p. 373.

† Biedert, *Jahrb. f. Kinderheilkunde*, 1888, p. 344.

means so well known as might be expected from the prevalence and mortality of the trouble. With scores of thousands dying yearly, reports on the pathology, accompanied by complete clinical histories, scarcely exist. The older authors, as Rilliet and Barthez,* report the results of a large number of autopsies, but their views of pathological processes were so different from those of to-day as to render them of comparatively little value.

Many of the more recent works simply make a few broad statements, devoid of all data as to source, which render them useless to the worker, in view of the confusion still reigning on the subject. It is therefore not possible to give any systematic description of the pathology in relation to symptoms,—indeed, those who have reported most autopsies deny any relation between the two,—but it is possible to gather a pretty clear idea of the changes which occur in the stomach and bowels.

First, it is to be noted that a child, especially if very young, may die, and the autopsy reveal almost nothing; also that, speaking in general terms, the longer the trouble has lasted the grosser are the lesions found.

The stomach has not been made the subject of examination as often as the bowels, but a sufficient number of reports exist to give a clear idea of the general process involved. All have found the stomach less affected than the bowels, both in number and in extent. Thus, J. Lewis Smith† found it normal in forty-two out of fifty-nine cases. The first changes are probably vascular with a coincident disturbance of the digestive functions, the digestive fluids being altered as to quantity and quality, and an increased amount of mucus produced. Hyperæmia may fairly be taken as the commonest change, but it must not be forgotten that in many autopsies the stomach is found pale. Shortly a more or less severe catarrhal inflammation is set up, which effects material changes. The sub-mucus becomes infiltrated with leucocytes, and the cells of the mucous layer swell, become filled with mucus (increase of

* "*Maladies des l'Enfants*," 1838.

† J. Lewis Smith, "*System of Medicine*." Pepper. Vol. ii., p. 726.

beaker cells), and cloudy. This change holds good of both the cells on the surface and in the crypts; the tendency is for the degenerated cells to fall off, leaving more or less bareness behind.

The changes induced by the degeneration of the mucous cells and the round-cell infiltration lead to the last stage, that of erosions,—that is, places devoid of the mucous coat, and the seat of more or less reaction. From here on the changes are either an increase in degree or those of resolution. If no erosions have been formed, it is easy to return to the normal by diminution in the amount of mucus, regulated circulation, and disappearance of the round cells. If erosions are present, it is generally accepted that small ones heal by the mucous coat growing from the edge and remains of the follicles, large ones by granulation. Where there has been extensive infiltration of leucocytes, connective tissue is formed, which by pressure destroys the crypts,—that is, atrophy results.

The contents of the stomach vary greatly, from a little mucus to a muco-purulent phlegm mixed up with the remains of all sorts of food, the mucus, curds, and fluid often making a most revolting mess. During life Leo,* by washing out the stomach, has found that gas and mucus are apt to be abundant, and that the food lingers in the stomach even for seven and a half hours.

Cholera infantum proper—meaning the symptom complex of cholera nostras in the adult—seems to offer a rather different picture. Here the stomach is pale, mucosa softened, and shedding submucosa, thickened, soft, round cell infiltrated, a sort of inflammatory oedema, cut short by death.

The changes in the bowels are diversified from those of the stomach by the introduction of the follicular elements. The upper part of the intestine has a tendency to paleness and little more, while lower down hyperæmia predominates. Thus Smith, in eighty-two cases, found hyperæmia of duodenum and jejunum twelve times; paleness only fifty-one times; hyperæmia of ileum, sixty-three times; of colon, eighty-one times. This is worthy of note: the parts where the food passes most

* Leo, *Berl. Med. Wochenschr.*, 1888, p. 981.

quickly are relatively free from change. But it must also be borne in mind that the lower parts of the intestines are exposed to the unhealthy conditions inevitably induced by disease above. An unhealthy bowel cannot pass on healthy chyme.

The hyperæmia is most often diffuse in the submucosa, the microscope showing it to be venous, at times stellate.

The changes in the mucosa of the intestines are similar to those of the stomach, and consist in swelling, cloudiness, and many mucous cells. The latter show very clearly in sections, stained, according to Gram, for bacteria. The villi are naturally liable to lose their epithelium early, but autopsies are made so late that all minute points of this sort are insecure. The submucosa is the seat of a round-cell infiltration, often extensive, extending through the muscle-coats along the chief lymph-channels.

The follicles, solitary and agminated, seem to vary considerably, but a review of many statements shows clearly that there is a strong tendency to crowding with round cells, which, if carried to an extreme, results in necrosis and the formation of an erosion or ulcer. These ulcers occur chiefly in the small follicles in older infants. Lewis Smith found no erosions of Pyer's patches in his eighty-two cases referred to before.

The contents of the intestines vary in consistency, color, and odor from case to case. There is generally a good deal of mucus; the green color so often seen in the stools occurs in the lower parts. Its origin has been much debated, but by general consent is attributed to biliverdin. The fact noted long ago by Bednar,* that stools passed on diapers washed in lye turn green, and the late article by Pfeiffer, seem to show that the green color is an indication of alkalinity of the chyme. Pfeiffer† holds from experiments that no acid known to occur in the bowels turns yellow stools green, while alkalies do so quickly. He also found bicarbonate of soda, when given to a three-months infant, to produce green stools. In my own

* Bednar, "Die Krankheiten der Neugeborenen und Säuglings von klinischen und pathologisch-anatomischen Standpunkte," 1850-1853.

† Pfeiffer, *Jahrb. f. Kinderheilkunde*, 1888, 164.

practice, however, I have often seen green stools become normal while bicarbonate of soda was being administered.

Kunrad* and others distinguish pathologically as well as chemically a distinct follicular enteritis, in which the changes noted above occur alone or with only slight patches of catarrhal inflammation of the mucosa.

The mesenteric glands undergo changes similar to the follicles,—that is, crowding with round cells and consequent swelling. The changes of other organs are by no means so well agreed upon, but the weight of evidence is clearly in favor of the view that the liver may be enlarged, engorged, contain more than the normal amount of fat (Hallowell),† and may also be the seat of round-cell infiltration (Gilbert).‡

The kidneys show at times a cloudiness and swelling of the cortex, not to be wondered at in view of the albuminuria noted by observers. The changes in the brain and lungs are so clearly the result of marasmus as to require no notice.

Etiology.—Passing now from the pathology to the etiology and nature of the disease, we find the following causes accepted in order of time: heat, improper feeding as such; fermentation, especially with improper feeding, reduced during the last year or two to bacteria. Lately the bacterial side of the question has shown a tendency to usurp the field, as cause proper, as is shown by the claims put forward for specific germs and the so-called antiseptic treatment. Besides the three causes mentioned, catching cold, predisposition, heredity, have been frequently pushed for a place.

* Kunrad, Gerhardt's *Lehrbuch der kinderkrankheiten*.

† Hallowell, "Enteritis, or Summer Complaint of Children," *Am. Jour. Med. Sci.*, 1847, p. 40.

‡ Gilbert, "Note sur deux Cas de Choléré Nostras," *Franc. Méd.*, 1887, p. 1749; see also Rokitsansky, "Handbuch der Patholog. Anat.," iii., p. 291; Parker, *Trans. Med. Soc. of New York*, Albany, 1857, p. 91; J. Lewis Smith, *Am. Med. Times*, New York, 1862, p. 160; Henoch, "Wood's Library," 1882; Birsch-Hirschfeld, "Lehrbuch der Pathol. Anat.," 1882; Ziegler, "Lehrbuch der Allgemeinen und Specialem Pathologischen Anatomie," 1884; Starr, "Diseases of the Digestive Organs in Children," 1886; Biedert, "Lehrbuch der Kinderkrankheiten." Von Vogel. 9te Aufl.; neu bearbeitet, 1887; Baginsky, "Lehrbuch der Kinderkrankheiten für Aertze und Studirende," 1887; Holt, *Medical News*, Philadelphia, 1888, p. 644.

That improper diet may bring about diarrhœa is so evident as scarcely to need note. But pickled lobster or other irritant food, even in the hottest weather, does not bring on a set attack of summer diarrhœa. The infant will vomit, purge, like as not have convulsions, when a physician will be called, and the child be well in a day or two. Barring convulsions, the thing tends to take care of itself, the food which irritates is ejected, the cause is removed, and the trouble vanishes. Could a simple indiscretion of diet cause summer diarrhœa, scarce a child would grow up, unless guarded by a picket of soldiers, such is the desire of old and young to give an infant whatever it appears to cry for. No sooner grasped than it goes to the mouth, the seat of the one fairly developed sense. Again, the epidemic occurrence of summer diarrhœa, especially during hot spells, points to causes decidedly influenced by the weather. Simple indiscretions are not so connected. It is therefore clear that the trouble under consideration is not caused by simple indiscretion in diet. This does not, however, preclude such articles of diet from setting up conditions favorable to the action of one of the true causes. Such is undoubtedly the case. The ingestion of various improper foods are too often followed by set attacks of diarrhœa to be the result of pure coincidence.

There is another class of improper feeding, that is, with continuous improper food. Such foods do not transgress the laws of physiology so outrageously as those of the first group; indeed, certain infants are capable of flourishing on any one of them. The various substitutes for breast-milk are referred to, varying from cow's milk to cow's milk plus some compound of vegetable origin, most all proprietary, and each the only proper artificial food. With all those foods it is merely a choice of which is the least bad; none are as good as human breast-milk. As a result, many children sicken, waste, and show various symptoms of digestive disturbance, while others are simply feeble and do not flourish. On the other hand, a good proportion do very well, and grow up to be strong, healthy children. This alone shows that even continuous bad feeding, which of necessity cannot be very bad, though the cause of much disturbance, which reduces the child to a state

readily to fall a victim to disease, is not in itself a sufficient cause of the trouble under consideration.

Again, like mildly bad feeding, this chronic bad feeding is perennial,—summer diarrhœa limited in time,—things connected as cause and effect must vary together. Foods as foods may therefore be ruled out as a direct cause. It is nevertheless clear that breast-fed children do better and suffer decidedly less from diarrhœa than the bottle-fed, but the breast-fed are by no means exempt. Buller* gives figures for 40,314 cases, from Bavaria, under one year; of these, 6753, 16.9 per cent. were breast-fed, 83.1 per cent. artificially-fed, of which, 58.7 per cent. were so fed from necessity. Monti, in 208 cases, found 21 were breast-fed; that is, 10 per cent. Johnston† found in 238 cases occurring in Leicester, England, 165 were breast-fed, 56 bottle-fed, 17 both. These figures show that the breast-fed are not exempt, that variations in proportion occur, thus rendering it unsafe to try to draw conclusions from any one man's experience. It is only fair to note here that all the tables and figures in regard to this matter ignore the ratio of the breast-fed to the bottle-fed in the community from which the figures are derived. Without this the figures show nothing as to the relation of feeding as a cause.

The weather, or, more properly, climate, including crowding, has been the subject of much consideration since the time of Benjamin Rush. A great many articles have been written and tables published tending to show a more or less close connection between the weather and summer diarrhœa. Any one of the tables seems to prove something, and nearly every one can be offset by another pointing the opposite way.

The first thing noted in studying health reports is that the great mass of deaths from diarrhœa are before the sixth year; indeed, in the first two and a half years. The following figures from the tenth census show this clearly:

* Buller, "Ursachen und Folgen des Nichtstillens in der Bevölkerung Münchens," *Jahrb. f. Kinderheilkunde*, 1887, p. 313.

† Johnston, after Uffelmann, "Zur Ätiologie der Cholera Infantum," etc., *Deutsch Med. Wochens.*, 1888, No. 10-13.

Total number of deaths of all ages during census year, 756,843.

	First Year.	Second Year.	Third Year.	Fourth Year.	Fifth Year.	Total.
Deaths from all causes.....	175,184	58,816	33,417	21,276	15,931	302,624
Diarrhoea.....	4,393	2,089	681	232	100	7,496
Dysentery.....	3,356	2,891	1,403	531	303	8,484
Enteritis.....	3,611	1,498	700	356	220	6,385
Cholera morbus.....	276	155	70	35	19	555
Cholera infantum.....	16,762	6,307	1,443	307	131	24,950
Total from diarrhoeas	27,398	12,941	4,297	1,562	773	47,870

The total figures for all ages for the five diarrhoeal diseases given being 10,825, 13,427, 12,640, 2116, 24,983; all together, 63,991. Roughly, three-quarters of the deaths from diarrhoeal troubles occur during the first five years. In other words, it is the diarrhoeas of infancy which are fatal. Owing to the wild and careless diagnoses so common in death-certificates, the special figures are of no value, and the totals for diarrhoeal troubles in infancy are well known to be too small, many cases being classed under convulsions, wasting, and the like.

Turning from the time of life to the locality in which diarrhoea prevails, it at once becomes clear that there is no set law. As a rule, the trouble prevails in the cities, and most authors speak of the trouble as an urban complaint. But, as Johnston pointed out, the death-rates in the different cities vary greatly, with little regard to location or the occupation of the people, and Haven* has shown that the small town of Nantucket gives a death-rate of 2.14 as compared with 1.66 in Boston. It is of interest, therefore, to see what figures on a large scale show.

* Haven, "The Etiology and Treatment of the Summer Diarrhoea of Infants," *THE JOURNAL OF PEDIATRICS*, 1886, p. 395.

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(Continued from p. 832.)

THE ARTIFICIAL FEEDING OF INFANTS.

BY ARTHUR V. MEIGS, M.D.,
of Philadelphia.

IN addressing a society the special purpose of whose existence is the study of the diseases of children, no excuse is necessary for having chosen as a subject the artificial feeding of infants. That preventive medicine can accomplish more for the general good than any other branch of our science is a fact which receives almost universal acceptance, and it must be acknowledged that so long as there continues to be any great disagreement among physicians with regard to how infants should be fed, of the various methods chosen, most must be bad, and from their pursuance must result the foundation in the earlier months of life of much disease. It is this diversity of opinion among those who are looked up to as authorities in the community that is most to be deplored, and it is a very hopeful thing to be able to believe, as for my own part I do, that this diversity not only will be, but actually is now being removed, owing to the efforts of scientific men to come

to a common understanding of the matter. In endeavoring to reach a conclusion there are, as I have already pointed out in previous publications,* but two possible methods, the one purely empiric, to experiment with various foods until the best is found; and the other, by analysis, or otherwise to learn as nearly as possible what human milk is, which we all know to be the most perfect food for infants, and then to make an imitation of it. It is a most fortunate thing that all knowledge of the subject at the present time, both that derived from the first as well as the second method of investigation, seems to lead towards a common conclusion.

It may be assumed that in civilized countries, at the present time, cow's milk forms the basis of all the different foods which are used for infants, for though there are here and there occasionally persons who recommend foods which contain no cow's milk, or even no milk of any kind, yet they are so few that they need not be taken into account. It has been said that both clinical investigation and analysis have of more recent years been leading towards an identical conclusion, and of this any one may be convinced who will turn to the more modern literature. For a long time most students of the subject have advised that, before administering cow's milk to young infants, it should be diluted, and more and more it will be found, as we come down towards the present time, that writers speak of the great advantages to be derived from the use of cream, and at the same time say that sugar should be added to the food. Such have been the results of the labors of practising physicians who have based their conclusions solely upon the effects they have derived from the use of different foods, recommending finally that with which they best attain their end,—the successful rearing of infants by hand. This is what has been learned from clinical investigation of the subject or, as it may be called, the practical study. Now, what have been the results of an approach to the subject from the theoretical stand-point,—of chemical analysis of various foods, and of cow's and human milk in particular?

* "Milk Analysis and Infant-Feeding," by Arthur V. Meigs, Phila., 1885.

So far as I have been able to learn, there has at no time been any disagreement among chemists in regard to the composition of cow's milk, results which for all practical purposes may be called identical, having been reached by all. When different analyses of human milk, on the other hand, are compared, it is seen that widely-diverging results have been reached. The differences have been in regard to the amounts of casein and sugar present, the estimates of various chemists of the other constituents having been alike. It is strange to notice, and very significant, that however widely the estimates of these two substances (casein and sugar) may differ, the sum of the amounts, if added together, is in every instance almost the same. This is not the time to draw up the figures in array and compare them, especially as I have already fully (*loc. cit.*) done so elsewhere, but it is remarkable that no one earlier suggested that the great variability presented by different specimens of human milk had no real existence, but was due to faulty methods of analysis. The mean analysis of Vernois and Becquerel has been and continues to be more widely quoted than any other single analysis, and yet their estimates of the various constituents are so nearly identical with the amounts of the different component parts contained in cow's milk that it might well be taken as an average analysis of good ordinary cow's milk.

At the same time that authors quote with approval the analysis of human milk of Vernois and Becquerel, they will state that human milk contains much less casein and more sugar than does cow's milk, never taking into account that the figures quoted directly contradict their statements, and failing to see that the explanation lies in the fact that the analysis is incorrect. More modern chemists, as a general thing, tend to estimate the casein at a less amount; and this is perhaps typified by the statement of Biedert that he accepts as correct the estimate of Vierordt of the casein of human milk at two per cent., but at the same time says that in the artificial feeding of infants not more than one per cent. of the casein of cow's milk must be introduced, because he finds that infants cannot digest it, and this he attributes to the greater degree of indigestibility of the casein of cow's than of human milk.

Wanklyn, in his book upon "Milk Analysis," strikes at the root of the subject when he says that within limits milk presents great constancy of composition, and that in this constancy of composition lies the whole basis of the value of milk analysis.

It is now more than seven years since I made the statement* that human milk never contains more than about one per cent. of casein, and that all the analyses, both the older and more modern ones, which estimated its amount as high as three or four per cent., were incorrect—from this statement I have never seen the slightest reason to recede. If this estimate ever comes to receive general acceptance among scientific men, owing to its truth having been so fully proved that no one can any longer deny it, a long step will have been made towards improvement in our methods for the artificial feeding of infants, for then, as there will be a good and plain reason why it should not be done, no one will dare to feed young infants upon pure cow's milk which contains three per cent. or more casein. One of the latest utterances upon this subject is to be found in the article upon "Infant-Feeding—Weaning," by T. M. Rotch, M.D., in the "Cyclopædia of the Diseases of Children," vol. i., edited by Keating. In an admirable essay, far in advance in its teachings of anything else upon the subject with which I am familiar, and embodying the results of much study, both from the theoretical and practical sides of the question, the author gives as a standard of the ordinary composition of human milk estimates of the various constituents almost identical with my mean analysis. In another part of the article he gives analyses in which he places the amount of casein as high as two and even four per cent. To me it seems impossible that we can ever place the subject upon a stable basis until it is either proved or disproved whether human milk can ever contain so much casein. From a considerable personal experience in the analysis both of cow's and human milk, I still hold firmly to my statement made years ago, in agreement with Wanklyn, that it is upon the

* "Milk Analysis," by Arthur V. Meigs, *Philadelphia Medical Times*, July 1, 1882.

quite near constancy of composition presented by milk that depends the value of its analysis to science. It is to be deplored, therefore, that Rotch did not mention the method by which his analyses were made, and give also the source from which he derived that which he accepts as a standard of the ordinary composition of human milk, for to any one of my way of thinking it is impossible to believe that both his analyses and his accepted standard can be correct.

Since the issue of my first publication upon this subject, I have never had reason to change any of the broader generalities upon which were based the advice in regard to feeding then given. The recommendations were the result of careful study of the subject from both the practical and the theoretical aspects, clinical experience having led me to select a food very nearly like that which I have since arranged; and then analysis having brought me, quite contrary to what my preconceived ideas had led me to expect, to a similar result. It is this agreement of the results obtained both from the practical and theoretical investigations that makes the case an especially strong one; clinical study having led to a conclusion, and then theory stepping in to confirm it and make plain the reason. Experience taught physicians that infants could not digest pure cow's milk which contains three to four per cent. of casein, and chemical analysis gives the explanation—human milk never contains more than about one per cent.

In medicine almost always more weight should be given to the teachings of experience than to the apparent indications of pure science and theory, and yet it has often happened that that which we have learned from practice and clinical study has been confirmed and explained by pure science. Where the two methods led to conclusions apparently contradictory, I should always prefer to abide, provisionally at any rate, by the results of practice. Though, as has been stated, I have seen no reason to make any radical change in my artificial food, which was based upon the dilution of cow's milk, for the reason that it contains too much casein; the further need for the addition of cream, because in diluting the fat was reduced to too small an amount; to the addition of sugar to make it equal to the amount contained in human milk; and of lime-

water to change it from being an acid to an alkaline fluid; I have fallen upon several improvements to render it easier to get together the required amounts of the different constituents and thus simplify the work of the nurses; besides which, I have had a good deal of experience in the actual use of the food, and therefore opportunity to observe its clinical effects. It is only in the directions indicated that I have anything which is absolutely new to detail, but perhaps some account of them may not be without interest to the members of the Society.

In the mode of preparation of the food, I have made one change which, though it in the end arranges the constituent parts in exactly the same proportions, is an improvement in that it simplifies the preparation and offers less chance for fermentation to take place. Cream is a material which, as it is ordinarily obtained in cities, and even if people have their own cow, has been kept so long that it is very liable to become sour. I therefore now direct—and this was alluded to in an article I published some time ago *—that instead of taking cream and milk in the proportions respectively of two and one in eight, three parts of a weak cream be used, which is obtained as follows: One quart of good ordinary milk is placed in a high pitcher, or other vessel, and allowed to stand in a cool place for three hours; then one pint is slowly poured off from this, care being taken that the vessel is not agitated, the object being to obtain the upper layer of fluid, rich in fat, and leave the lower, comparatively poor portion behind. When the child is to be fed, there are taken of this weak cream three tablespoonfuls, of lime-water two tablespoonfuls, and of sugar-water three tablespoonfuls. The sugar-water is to be made in the proportion of eighteen drachms of milk-sugar to one pint of water. This makes only four ounces of food, and if the infant is old enough to require eight ounces at once, double the quantities of each of the ingredients must be mixed. This is simply warmed in a bottle, as usual, and is then ready for use. Analyses of mixtures made according

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* A paper read before the Pediatric Section of the New York Academy of Medicine upon the "Dietetic Management of the Summer Diarrhœa of Infants," *Medical News*, July 7, 1888.

to these directions have shown me that the proportion of fat is the same as when the food is prepared as recommended in my earlier works, and the plan is much better, because more economical (cream being expensive), and the food is less likely to ferment. In the article by Rotch, which has already been quoted, he suggests that it is of advantage to use the sugar in powder instead of dissolving eighteen drachms of milk-sugar in a pint, and recommends the use of three and three-eighths drachms of sugar to eight ounces of food, to be made exactly as directed above, except that the sugar-water is then substituted by an equal amount of plain water. To obtain the desired amount (three and three-eighths drachms) of sugar, he has had constructed a little measure which will hold just that quantity. Doubtless this suggestion is a good one, and in many instances it will be of advantage to follow it. He also criticises my food on account of the amount of lime-water it contains, and says that it is much more strongly alkaline than human milk. This statement he supports by saying that he has had the degrees of alkalinity of the two fluids, human milk and an artificial food, made as I have directed, tested, with the result above stated. As he does not mention the method used in making the test, though it was presumably by neutralizing certain quantities of an acid of a standard strength, and as clinical experience, which I have already said I think should be given much more weight than theoretical reasoning when unsupported by practice, has given me most admirable results, much better than with any other food, I am disposed still to think the mixture a good one. The criticism of Rotch is however a just one, and quite admissible, and it will be for the future to determine which is the better proportion of lime-water, the amount I have recommended or that he suggests (one-sixteenth of the total volume).

During seven years I have had a good deal of experience in the use of the food in private practice, and in the last two in an institution where there are always quite a number of foundlings. From both methods of trial the results have been better than my most sanguine hopes had led me to expect. In private practice, if I have had intelligent people to deal with, and could gain their confidence so that they would

do exactly as I directed, the result has almost uniformly been success; on the other hand, if people are foolish, and try a succession of different foods, or are impatient, so that they will not hold to the plan long enough to give it a fair trial, failure often attends one's most strenuous efforts. The greatest difficulty that I have to contend with in the effort to artificially feed any infant successfully is this natural impatience on the part of parents, which expresses itself in the desire to be constantly trying different foods in such rapid succession that no one of them is given an adequate trial. The task of the physician therefore is, and an infinitely difficult one it often proves to be, to decide in his own mind definitely what food will be most suitable for any given case, and then with all his might, until there arises some real and definite reason to think he is in error, to hold to it in despite of the opposition of parents, nurses, relations, and friends. His worst enemies will often prove to be the nurses, especially if they be old, for the knowledge necessary to make up the education requisite for nursing is just enough to make them often think they know much more than they do. How often I have been brought almost to desperation by finding that an old nurse was defeating all my best-laid plans, and in such a way that I was entirely powerless to effect anything!

The results of the use of the mixture during my terms of service in the past two years in an institution have been most curious. There can be no test of an artificial food so severe and none therefore so good as to feed infants with it from the very hour of their birth, and it has always been my desire to test my mixture, if the opportunity ever arose, in this manner. When I began its use in an institution (the Sheltering Arms of Philadelphia), I was careful to direct its administration only to very young infants, upon their first coming under our care, and to those who after a fair trial of whatever they might previously have been taking evidently did not thrive, so that a change became necessary. No radical change, therefore, was made in the manner of feeding infants already inmates of the institution. The general results attained at the end of my first term of service were most discouraging, all the infants brought in during the first few weeks of life died, and many

of the older ones, and the worst was that a goodly number of them died of infantile atrophy. When I looked back and contemplated the result of my efforts,—total failure,—I was at times disposed to be in despair, and to give up the struggle which had been in many ways a very hard one, and in the course of which I had had many obstacles to contend with, some of which had been overcome while others had for the time proved insuperable. Two things, however, would return to my mind whenever I thought of the subject, and their contemplation gave me courage to renew my efforts,—they were that in private practice I had had such uniformly good results from the use of the same food, and that the class and condition of the infants was such as necessarily to render their rearing a most difficult task, for most of them were brought to us in a very bad state of nutrition, and were, in many instances, foundlings that had been already half starved or exposed. Reflection upon these considerations could but lead to one of two conclusions: either the infants were, without a single exception, so unhealthy that they had not sufficient vital force to live upon a food that did perfectly well in almost all instances in private practice, or else my directions had not been thoroughly carried out. Soon the further conclusion forced itself upon me that the latter must have had a large influence in causing my failure, for among my subordinates, who were to carry out my plans, not one—nurses, attendants, or any one else—had the slightest faith in my method, and though in some instances I was sure they conscientiously did their duty, yet it was only in a half-hearted way, for they had no faith, and looked forward only to failure; in others, I had reason to know that the food was not given as directed. When the time came to enter upon a second term of service the aspect of affairs had undergone a great change, all those who were to work subject to my direction had been long enough in the institution to have become pretty well discouraged at finding their own efforts almost entirely futile, as a very large proportion of the infants still continued to waste and die. The only notion that seemed very prevalent and to have much strength was a belief that Mellin's food was a very excellent thing. As I had already formed a favorable opinion of this food my-

self, I determined to turn the desire to use it (that evidently existed) in the direction of gaining my own ends. This I did by directing that the infants, all those young enough, should be fed upon my mixture with the addition of a teaspoonful of Mellin's food to each eight ounces, and by this means began my work with a satisfied and even enthusiastic set of assistants. It was soon found necessary to do something to make it easier to obtain the needed weak cream than setting it in pitchers, and this was easily accomplished by having a high tin cylindrical vessel made about six inches across and perhaps a foot or eighteen inches in height, which would hold exactly six quarts. In the side of this vessel, just half-way between top and bottom was a small hole which was stopped with a cork; this simple arrangement being used rather than a stop-cock, because so much more easily kept clean. This vessel was filled with milk, and, after being allowed to stand for three hours in a cool place, the cork was removed and the upper half of the milk ran into a vessel placed to receive it, giving three quarts of cream of the desired strength. The results obtained from the use of the food during last winter were simply marvellous, one or two infants that were so wasted when the change was instituted that it seemed that they must surely die recovered, becoming well nourished and healthy, and throughout the whole season we only lost one baby of true infantile atrophy. It seems to me that it would be very absurd to suppose that the good results attained were in any material way brought about by the addition of Mellin's food, which I used merely to please my assistants, for I have as a rule had just as much success in private practice when it has not been used.

Most of these infants thrive and seemed to be well until they were nine months or even a year old; but during the past summer many of them have died. The most common mode of death was for them to be seized with convulsions while in apparently good health, except that they were teething, and to die in from a few hours to a day or two. Notwithstanding these great discouragements, it really seems as if a step in advance had been made, for, so far as my own experience is concerned, I have succeeded in preventing the im-

mediate commencement of wasting in foundlings upon their admission to an institution. The question remains an open one, whether they died during the teething process, as they did, because the diet was faulty, or if it was on account of bad regimen. For my own part, I am more than half inclined to think the latter, for in private practice and in the institution I have used exactly the same food, but how different has been the care and management of the infants, and how different the results! It is to be hoped that further study and more time will enable us to overcome the difficulty, whatever it may be, though it should be remembered that the material dealt with (foundlings already injured by exposure and neglect, and a large proportion having within them the seeds of hereditary disease) must always be the most difficult possible to manage.

There can be no doubt, I think, that of late years we have made very great strides in advancing our knowledge of the proper *rationale* of infant-feeding, and have had correspondingly increased success in coping with the practical difficulties to be overcome, as evidenced by the much larger number of infants that are successfully brought up by hand. It is unfortunate, however, that the knowledge which makes it possible to do this is still confined to a comparatively small part of the profession, the majority of physicians not interesting themselves sufficiently in the subject to take the trouble to learn the principles upon which an understanding of the method is based. It is to be hoped that the time is not far distant when it will be as fully acknowledged and as universally known that to artificially-fed infants the best method is to take cow's milk and dilute it, and use cream, sugar, and lime-water, as it is now a common dictum that the diet in typhoid fever must be liquid.

Improved modern methods of feeding, and the greater degree of success attained thereby, have made it proper to look upon the question of employing wet-nurses from a somewhat different stand-point from formerly. The results of artificial feeding used to be so bad that in all cases, if it was in any way possible, it was wrong not to obtain a wet-nurse. Now we may give much more weight to a consideration of the many risks run from the woman's being perhaps diseased

X or having an insufficient supply or bad quality of milk, and that they are so apt, in this country at least, to become discontented, and go away without previous notice, just at some critical period of the infant's life. The class of society from which wet-nurses are drawn is a very low one, for they are, as a general thing, either women from the lowest ranks of life, who have had illegitimate children or have been deserted by their husbands, and therefore the chance of their being diseased is very great; and, besides, they are generally of such a low order as to be difficult to manage. Upon the other hand must be set the facts, that in artificial feeding, if the food is impure or the various component parts are not present in the right proportions, the fault is ours, and the remedy is easily applied. If we have intelligent people to deal with, and have their full confidence, so that they will carry out implicitly the directions given them, infants may be hand-fed with great success, and in some instances with more success than from the employment of wet-nurses, though, of course, there is not now and probably never will be, found any artificial food which will be equal to that provided by nature when it can be had at its best.

The end to be striven for in order that more general success may be attained in the artificial feeding of infants is to diffuse more widely and to make common property of the knowledge how small a proportion of casine exists in human as compared with cow's milk, and that in addition to the dilution which is necessary to reduce the amount of this constituent we must use in proper proportions,—cream, sugar, and lime-water.

DISCUSSION.

DR. HOLT.—I have had quite a large experience in the use of the mixture suggested by Dr. Meigs, and it has seemed to me that it was a better working formula than any which I had previously used. As he has stated, there are some objections, but these can be readily overcome if the patient is intelligent and can be brought to realize the importance of the measures. The simplest way of making the sugar-water is to add eight heaping teaspoonfuls to a pint of boiling water. That makes about the strength indicated by Dr. Meigs. If the water has been boiled, we are sure that it is sterilized.

Sugar of milk is liable to contain impurities ; but they can be easily filtered out of a solution.

There is another side of this question which seems equally important,—that is, the quantity and the frequency of feeding. Many mistakes are made in regard to these points. For some time I have given attention to the measurement of children's stomachs, and have made a series of experiments, having the children weighed before and after nursing. It has been my experience and observation that artificially-fed children are often fed two or three times too much, and also much too frequently, especially at night. There is no doubt that indigestion and diarrhœa are due, in very many cases, quite as much to the quantity and the frequency of feeding as to the quality of the food given. Even if the food is properly prepared, trouble will follow if attention is not paid to the quantity given. Often, by no other treatment than reducing the quantity of food, we cure a prolonged dyspepsia.

DR. KEATING.—This is a subject in which I have taken considerable interest ; and I have followed Dr. Meigs's investigation with care. It has been the experience of every one that infants thrive better on milk if it is diluted. The great mistake has been over-feeding.

There is another important point. The nutrition of the infants does not depend alone upon the quality of the milk taken. This milk must be digested and assimilated, and many weak and feeble children who inherit faulty digestions are not able to digest the milk. We have, therefore, in addition to the preparation of the food, to prepare the digestive organs, and see that the proper juices, on which depend the digestion and assimilation of the food, are secreted. This is a matter which should be taken into consideration in discussing this subject, and must never be forgotten.

DR. FRUITNIGHT.—I have but a word to say in reference especially to the method of administering artificially-prepared foods. At a recent meeting of the physicians of St. John's Guild of New York, it was the universal opinion that the ordinary nursing-bottle, with the long tube, should be prohibited, and that it was a frequent cause of gastric and intestinal derangement. It was the sense of those present that the simple nipple should alone be used.

DR. BOOKER.—I have used Dr. Meigs's preparation in a number of cases of summer diarrhœa, and have gotten good results in some. There are, however, many cases of diarrhœa in which cream is not easily digested. If the fæces are examined, oil globules are found in large quantity. I therefore do not see the advantage of increasing the quantity of

cream when they cannot digest that which is ordinarily present. I now use sterilized milk, diluted with water, according to the age of the child, and have obtained as good results, if not better, than with any other preparation.

DR. WINTERS.—It has been remarked that the majority of physicians take more kindly to so-called infant's foods than to cow's milk. It is the experience of every physician that it is unusual to find children artificially fed with cow's milk. This is true not only in the city, but also in the country, where fresh cow's milk may be readily obtained. My experience coincides with that of Dr. Meigs in regard to the value of milk and the failures with artificial foods.

The method of obtaining cream fresh from the milk is also of importance. During the spring of 1881 I delivered some lectures on the feeding of infants, and at that time I stated to the class that, in my opinion, there was only one food for children deprived of the mother's milk, and that was cow's milk; and that it seemed to me that I had found out a way in which children could be brought up successfully on cow's milk. This was suggested to me by a visit to a creamery where butter and skimmed-milk cheese were made. I watched the process of the separation of the casein and of the cream, and this suggested to me the method of feeding children on cow's milk, and of having a small proportion of casein in the milk. I have carried this method out in private practice for the last eight years. If fresh milk is obtained, and from this cream is taken, as Dr. Meigs suggests, and if attention is paid to the quantity given and the frequency of feeding, there is no difficulty in bringing up children on cow's milk. Among the poor, in large cities, the difficulty is to obtain fresh milk. The bulk of artificial feeding is now among the tenement population. The wealthier classes seem more disposed to nurse their children than they did five years ago.

DR. ADAMS.—In 1885, when I denounced all sorts of infant foods, in an article on "How shall we feed the Baby?" in the ARCHIVES OF PEDIATRICS, it was with "fear and trembling" lest the physicians who endorsed them would attack me. There has certainly been a great reaction since that time, for no one present has endorsed a single food during this meeting. My experience has led me to the conclusion that cow's milk, properly prepared and properly administered, is the only substitute for human milk. I accept the method of preparation recommended by Dr. Meigs as the best.

In the Children's Hospital of this city, we have had very few cases, during the past summer, of simple gastro-intestinal catarrh. In two cases my success was not such as I had had

in private practice, and, on investigation, I found that the resident physician was experimenting with peptonized and pancreatized milk. As soon as this was stopped, and properly prepared cow's milk substituted, the cases quickly recovered.

In a recent paper in the ARCHIVES, I call attention to a new form of food, in which the sterilizing process has been taken advantage of to advertise a "Homœopathic Sterilized Milk." I refer to two cases, and others have come to my notice, where infants have been nearly starved to death when fed upon it. This is, therefore, to be added to the long list of unreliable foods.

DR. CAILLÉ.—I am surprised that Dr. Meigs did not refer to the sterilizing process in the preparation of his mixture. It is just as important to prepare the milk properly and keep it properly as to give it in proper doses at proper intervals; and as some of the main difficulties in infant-feeding are overcome by sterilizing the food, the process of sterilizing by steaming should receive proper mention whenever the subject of infant feeding is under discussion.

DR. JEFFRIES.—In regard to sterilizing milk, it is important to recognize the fact that the sterilizing should be done early. Many sterilize the milk after it is partially decomposed, and the chemical products are then left in the milk. Such milk is poisonous to animals and to children.

DR. MEIGS.—In reference to measurement of the stomach after death, I have found the greatest variation in size of the stomach in infants of the same age, the capacity being sometimes as little as five drachmas, and again as much as eight ounces, in young babies. The size of the stomach depends much upon the mode of death; and therefore I do not think accurate or valuable results can be obtained in this way. In regard to ascertaining the amount of food taken, by weighing infants before and after nursing, it would seem that no very reliable results have ever yet been obtained by this procedure. The method was introduced by Guillot, and further elaborated by Parrot (Clinique de Nouveaux Nés), but he concludes that the amounts taken by young infants are so small (six or eight ounces in twenty-four hours), that his results must be looked upon as erroneous. Dr. J. Forsyth Meigs published an essay in which he gives the amounts drawn artificially from three different healthy women in twenty-four hours, and the average was a quart or a little more. Even an observation of this sort would have more value than many experiments of weighing infants before and after nursing, for the results, so far as they go, are absolute.

The fact that oil is found in the ^{stomach} ~~pus~~ of artificially-fed

infants has never seemed to me to be a valid argument against the use of cream, for free oil is always present in the stools of nursed infants, and it is not for us to judge why nature provided an excess of oil. When by some method of artificial feeding we obtain better results than are to be had from infants being nursed, then we may criticise the presence of free oil in the fæces.

The subject of the sterilization of milk I did not touch upon, because there was not time to do it justice without occupying more time than could be given. It does not seem to me to be necessary in all cases; and among the very lowest classes, where the necessity for it is greatest, it is almost impossible to have it adequately carried out, owing to the ignorance and helplessness of the people. In some instances, and where it is thoroughly done, its value is, without doubt, very great.

RECENT IMPROVEMENTS IN INFANT- FEEDING.*

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No subject relating to the care of infants, in the first year of life, is more important than the selection and preparation of their food when they are deprived of breast-milk, and none has received more attention. The use of improper or badly-prepared food is a common cause of infantile sickness and death. Infants deprived of their mother's milk, or its substitute, the milk of the wet-nurse during the period when nourishment at the breast is the proper mode of alimentation, have until recently, if we may speak from our experience in New York City, nearly all perished soon after birth, and from causes which were plainly referable to the mode of feeding. This remark is not an exaggeration. My observations fully justify the statement. Several years ago, before the New York Foundling Asylum was organized, the foundlings of New York were assigned to the care of the pauper women in the Almshouse on Blackwell's Island. Their diet consisted

* Read by title.

mainly of cow's milk, which arrived every morning in cans from the country, and was prepared and administered according to the judgment of these women, or of the matron. It was more or less diluted with water, and sometimes some farinaceous substance was added. The steamboat every morning brought foundlings to the island, and every afternoon removed an equal number for burial in Potter's Field. To me was assigned the unpleasant duty of visiting and prescribing for these foundlings, and a single infant was pointed out to me which had not died in the usual time.

When the New York Foundling Asylum was incorporated, in 1869, the foundlings received the care and personal attention of a large, intelligent, and self-sacrificing sisterhood, and a liberal outlay of money provided for the wants of the foundlings. But under the intelligent management of this institution the discovery was soon made that foundlings without the breast-milk gradually wasted, had indigestion, vomiting, and diarrhœa, and finally a gastro-enteritis, ending in death. A large maternity service was established in the asylum, which provided wet-nurses, so that a considerable proportion of the foundlings receive breast-milk, and their lives are saved; but the foundlings are numerically in excess of the wet-nurses, and the result of the bottle-feeding of those who are not wet-nursed has been similar to that in olden times in the Almshouse.

The experience as regards the disastrous results of bottle-feeding has been the same in the New York Infant Asylum as in the Almshouse and Foundling Asylum. This institution was at first under the management of Mrs. Richmond, a woman of great executive ability and intelligence. She obtained the charter for the asylum in 1865, organized and opened it, at an apparently favorable site on the banks of the Hudson, but within the city limits. In this institution also the fatal mistake was at first made of bottle-feeding the infants, a mistake with which I was more and more impressed each day, as I was the attending physician. About twenty-five infants, mostly under the age of two months, were admitted at the opening of the building, and were fed from the bottle, as were also those who were subsequently admitted;

but, as in the Almshouse, the deaths from innutrition, diarrhoea, and marasmus were equal in number to the admissions, so that, although cribs had been provided for one hundred and fifty infants, it was seldom that more than twenty-five or thirty were occupied. The disappointment of the devoted and philanthropic woman at the head of the asylum probably shortened her life. After her death the asylum was reorganized, a large maternity ward added to it, which furnished wet-nurses, and since this change the death-rate has been greatly reduced, and the Infant Asylum is now regarded as one of the best-conducted, and most successful of the charitable institutions in New York.

Facts might also be presented showing the unfavorable results of hand-feeding in private or family practice. Wet-nurses are largely employed in New York even in families in which the mothers are fully competent to suckle their own infants, and the mortality of the infants of the wet-nurses, thus abandoned by their mothers and bottle-fed, is very great. According to my observations, a large majority of them die, and in the same manner as in the institutions, the mortality being soonest and most certain in the summer months, when gastro-intestinal diseases are most prevalent. But it is not necessary to cite instances showing the disastrous effects to young infants of the substitution of artificially-prepared food for breast-milk, for, however it may be with the laity, physicians are fully aware of the facts as I have stated them.

But in the large cities, and especially among the poor of the cities, there are many instances, in which maternal lactation is impossible, and wet-nurses cannot be obtained on account of the expense, or for other reasons; and how to feed these infants, deprived of nourishment at the breast, is one of the most important problems which the physician is called upon to solve. In my opinion, in order to obtain a clear and accurate understanding of the subject which we are now considering, it is necessary to accept the following propositions:

1. Mothers who are fully capable should wet-nurse their own infants until the age of ten or twelve months. The common practice in wealthy families of employing wet-nurses, from the belief that lactation impairs the health and reduces

the strength, or in order that the mothers can have more time for social purposes, should be discouraged. There are other and strong reasons why mothers who are in good health should suckle their own infants, but a sufficient reason is that gross injustice is done to the infants of the wet-nurses, since, as we have seen, a large proportion of them die when abandoned by their mothers. But a mother with grave organic disease, or with permanent ill-health, which reduces the quantity and impairs the quality of her milk, should not be allowed to suckle her infant. She should consent to the employment of a wet-nurse.

2. The employment of a wet-nurse is preferable to hand-feeding for an infant under the age of six or eight months, provided that she have the proper qualifications. But hand-feeding, with its risks, is preferable to the employment of a wet-nurse who has not the proper mental and physical qualifications, such as temperance, equanimity, a sense of duty, good health, and sufficient milk. I could mention instances of the most disastrous results from the employment of bad wet-nurses. A recent western medical journal published the experience of a family, who allowed their wet-nurse to visit her friends one evening. She spent the night in debauchery, and returned haggard and fatigued on the following day. The baby took her breast, but was immediately seized with vomiting and purging, which ended fatally in a few hours. I could mention instances, which I have observed in New York, in which severe sickness, and sometimes death, resulted from the employment of wet-nurses mentally or physically unfit for the task which they had undertaken, so that I repeat it is better to bottle-feed the baby than intrust it to a wet-nurse who is lacking in any of the important qualifications.

3. Animal milk should be the basis of all artificially-prepared foods for infants. This fact is recognized in the preparation of the many infantile foods which the shops contain, since milk largely enters into their composition, or it is added in the nursery.

4. Animal milk—by which I mean cow's milk—is digested more slowly and with more difficulty than human milk; and its indigestibility is largely due to its casein, which exists in

larger proportion than in human milk, and is likely to coagulate in the stomach in large curds, on which the gastric juice acts slowly. In order to produce coagulation in small masses or flakes, such as occur in human milk, and thereby render the digestion of cow's milk more easy, the following methods of treating the milk have been proposed: 1st, steaming the milk, or subjecting it in a steamer to a heat of 180° to 190° F. not less than two hours. The prolonged action of heat at this temperature appears to render it less liable to form large curds in the stomach; 2d, peptonizing the milk by the process recommended by Fairchild Brothers; and, 3d, adding to the milk, at each feeding, some farinaceous substance, as barley flour, which mechanically separates the particles of casein, and thus tends to prevent the formation of large caseous masses in the stomach. All three of these methods, designed to promote the coagulation of casein in small masses or flakes, and thus facilitate its digestion, are useful in practice.

5. The fact is stated in the text-books, and in monographs relating to infant-feeding, that infants under the age of three months are able to digest only a very small amount of starch, since the glands, which secrete saliva, which is the chief agent in digesting starch, exists in an almost rudimentary form until after the third month. But starch converted into glucose by the action of the diastase of malt, or into dextrine by the prolonged action of heat, can be digested by the youngest infants.

6. In the feeding of infants, food which is not entirely predigested, and which therefore stimulates the functional activity of the organs which furnish the digestive ferments, is preferable, as a rule, to food which is entirely predigested, and which therefore requires only absorption, provided that the digestive organs are not over-taxed, and the digestion is easy and complete. This statement is based on the fact that the healthy development of the infant requires the normal functional activity of all its organs, of those of the digestive system as well as of the other systems; but for infants in a very prostrated state food of the proper kind, which is fully digested, may for a time be preferable.

The increased attention given to infant-feeding in this

country in recent years, and the contributions to the literature of this subject by such well-known specialists in children's diseases as Rotch, Meigs, and Jacobi, have certainly had its effect in improving the diet of infants, and diminishing the frequency and severity of diseases of the digestive system in the critical period of infancy. The occasional irrigation of the stomach of the infant suffering from indigestion and gastric catarrh, by which noxious products are removed and a healthier digestion produced, brought to the notice of the profession in America by Dr. Seibert, and successfully practised by him, has apparently been very useful in some instances. The exhaustive study of the microbes of the gastro-intestinal surface by Booker, has made known to the profession a knowledge of the agents, by which unhealthy fermentative changes and gastro-intestinal catarrh are produced, so that the remedies can be more intelligently employed. The sterilization of milk, recommended by Soxlet, whose apparatus for this purpose was exhibited by Dr. A. Caillé to the Pediatric Section of the New York Academy of Medicine, by which the microbes which produce early fermentative changes in the milk are destroyed, is now generally practised in New York, with much apparent benefit.

With the knowledge thus obtained by the experience of competent observers, we are now able to announce a mode of feeding infants deprived of breast milk which gives far better results than were obtained by the methods formerly employed. The following mode of preparing the food and of feeding infants, which I find useful, and in most instances satisfactory, may afford some assistance to those who have not given special attention to infant-feeding.

Cow's milk of the best possible quality should be obtained from a company that promise to inspect the dairies that furnish the milk several times during the year, and exclude such cows as are ailing. They should provide good pasturage, free from noxious weeds, and with abundant pure drinking-water; should reduce the temperature of the milk to 60° F. immediately after the milking, in open vessels surrounded by ice or running water, and make no subsequent addition to it. It should be delivered in air-tight bottles, so that it receives none of the

air from the streets, which, in the cities, is loaded with organisms, pathogenic and non-pathogenic, especially in dry and windy weather. Milk, as I have stated above, should be the chief ingredient in the food of infants. As soon as received by the family, it should be placed in a steamer, with the cover of the bottle loosened, and should be maintained two hours at a temperature of 180° to 190° F. This destroys any microbes which may have fallen into the milk from the udder of the cow or from other sources, and arrests any chemical change, which begins early when microbes are present, especially in warm weather. After the steaming, it should be surrounded with ice in the refrigerator. This mode of steaming is essentially Soxlet's and Caillé's method.

The second and an important ingredient in the food of infants is the flour of one of the cereals. It should, in my opinion, be flour that has been subjected in a dry state for days to the heat of boiling water, which converts a considerable portion of its starch into dextrine; and if a part of the starch is not dextrinized, it appears to be so changed that it is easily digested, not overtaxing the digestive function of infants under the age of three months. In New York I now constantly prescribe barley flour which, in a double-boiler, has been subjected to the heat of boiling water for seven days. For convenience of prescribing, it has been placed in a drug-store (McIntyre's, Fifty-sixth Street, Sixth Avenue). I have also induced a family to prepare wheat flour in a similar manner; but they have been unwilling to place it in a drug-store, as they have obtained an abundant sale of it at their house.

How shall the flour thus prepared, and the milk which has been sterilized by heat, be used in the nursery. The following are the directions, which I have repeatedly given to nurses, and in most instances I have not been obliged to change them: Add a heaped tablespoonful (nearly two even tablespoonfuls) of the flour to eighteen of cold water, which has been boiled. The gruel may be brought to the simmering point, to facilitate the admixture. For infants over the age of six months, in ordinary health, six tablespoonfuls of the sterilized milk and six of the gruel may be mixed for one feeding. Salt should be added until it can be tasted.

For infants between the ages of three and six months, and for those older than six months, who have symptoms of indigestion or gastro-intestinal catarrh, it has seemed to me advantageous to peptonize the milk; and I have thus far employed for this purpose the peptogenic powder prepared by Fairchild Brothers. Five tablespoonfuls of milk, two of the barley flour, two of water, and the peptogenic powder as much as fills the small measure which accompanies the powder should be mixed and heated six minutes with constant stirring, but not at a temperature too hot to be sipped (Fairchild). The food thus prepared should be fed to the infant at intervals of three hours, or, if it be hearty and fretful, at intervals of two and a half hours.

It is very important to determine how to feed infants who are under the age of three months, and are unfortunately deprived of the breast-milk. At this age the stomach is small, not holding more than two or three ounces without a distention which causes fretfulness, and the infant requires feeding every two or two and a half hours. My method of feeding infants of this age may be best shown by the following case which I have at present under observation: An infant of three weeks, previously fed with canned condensed milk, was in a critical state from a severe diarrhoea, the stools being not only frequent and watery, but only partially digested, and so irritating that a severe erythema of the nates had resulted. The infant was constantly fretful when awake and its sleep was insufficient. Two and a half tablespoonfuls of sterilized milk, one of water that had been boiled, one of the barley gruel, and the measure half-full of peptogenic powder, mixed and heated six minutes, with constant stirring, were given to the child every two hours. Each feeding was preceded by a dose of subnitrate of bismuth and a small amount of pepsin, the use of which, under such circumstances, we will presently consider. The infant with this feeding immediately improved. The fretfulness ceased, the stools became less frequent and of normal appearance, and the family, entirely satisfied with the result, are not inclined to follow my advice to obtain a wet-nurse.

Often, in New York, physicians are summoned to infants

who have severe diarrhœa, probably with vomiting, the result of improper feeding. Such attacks are common in the summer months, and the disease is often designated cholera infantum. Usually, I think, in these cases it is best to withhold all milk for perhaps two or three days, and administer only cold barley water, with no addition except salt and perhaps the white of the egg. In severe cases I have administered only this food during several successive days.

The medication of young infants is to me unpleasant, and I do not prescribe medicines for them if I think that a healthy and normal state of their systems can be procured by hygienic measures; but so many infants die from imperfect digestion of their food, and consequent malnutrition, that I do not hesitate to recommend for use at each feeding, if there be symptoms of indigestion, some form of pepsin, which will aid the digestive process. The following are formulæ which I have employed with apparently good results during the last two years.

R Pepsini puri, in lamellis, $\mathfrak{z}i$;
Lactopeptine, \mathfrak{z}_{ss} . Misce.

Sig.—Give half as much as will go on a ten-cent piece to as much as will cover a nickel five-cent piece before such feeding.

R Pepsini puri, in lamellis, $\mathfrak{z}i$;
Vini pepsini, N. F., \mathfrak{z}_{ss} ;
Aque destillat., $\mathfrak{z}iiiss$. Misce.

Sig.—Give twenty to twenty-five drops to an infant of four to six weeks before each feeding, and one teaspoonful to an infant of six months.

If vomiting or diarrhœa be present, subnitrate of bismuth should, I think, always be given in large doses with the pepsin. The following are formulæ which I employ.

R Bismuth subnitrât., \mathfrak{z}_{ss} ;
Pepsini puri, in lamellis, $\mathfrak{z}i$;
Vini pepsini, N. F., \mathfrak{z}_{ss} ;
Aque destillat., $\mathfrak{z}iiiss$. Misce.

Sig.—Give one teaspoonful before each feeding to an infant above the age of six months, half a teaspoonful between the ages of two and six months, and twenty-five drops to infants under the age of two months.

R Bismuth subnitrât., \mathfrak{z}_{ss} ;
Pepsini puri, in lamellis, $\mathfrak{z}i$. Misce.

Sig.—Give, before each feeding, as much as goes on a ten-cent piece to an infant of three months; to one of six months, as much as goes on a five-cent nickel piece.

The good results, in my practice, of the mode of feeding which has been described above was apparently mainly due to the use of sterilized and peptonized milk and barley flour, subjected to the prolonged action of heat (seven days) and to use of pepsin with each feeding, if symptoms of indigestion occurred, and subnitrate of bismuth in large and frequent doses, if symptoms of gastro-intestinal catarrh appeared. Other writers on the diet of infants have published formulæ for the preparation of foods which have undoubtedly been useful and some of which I can recommend from personal observations, but the mode of feeding which I have described is perhaps the best with which I am acquainted for general use. Still, I hope to learn from the Pediatric Society some better mode of infant-feeding, especially as I see by the programme that one who has had ample experience, and is widely and favorably known for his contributions to the dietetics of infancy and childhood, will also discuss this subject.

TREATMENT OF SCARLET FEVER AND ITS COMPLICATIONS.

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BECAUSE the subject of this paper is a broad one, and its discussion can be extended to an undefined limit, I shall invite attention more particularly to certain points, such as the treatment of the fever, the angina, and the specific complicating nephritis, otitis, and cervical cellulitis-adenitis. Others will be cursorily touched upon. It is not anticipated that anything new or startling will be offered you in this article. What I have to say is based upon my clinical observations, made upon nearly one thousand cases of the disease occurring in my own practice during the last fourteen and a half years. These cases naturally have ranged in severity from those of scarcely a week's duration to those which have dragged their length into weary months. The collation and comparison of the clinical

experiences of many practitioners ought to be both profitable and instructive. This last-expressed idea is therefore the *motif* of the present essay.

Fever of a higher or lower grade, and pharyngeal irritation more or less severe, are the pathological factors which will be met with in every case of scarlet fever. In every case of the disease, therefore, measures must be adopted to combat these conditions. I will discuss the treatment of the fever first.

It has been quite firmly established that the human organism can be subjected to a high degree of temperature and not succumb. Though this be true, it does not follow that a *laissez faire* policy must be pursued as regards the fever; for in my opinion, if the fever can be reduced by art, the patient is made correspondingly more comfortable, and whatever tends to increase the comfort of the patient assists in directing the attack of illness, as a whole, to a favorable termination. Before the introduction of the recently-discovered antipyretics, it had been my custom to treat the fever with aconite. The preparation which I employed was the ordinary tincture of the root of the plant of the United States Pharmacopœia. I administered it in doses of one-half drop to one drop, according to the age of the patient, every hour in the beginning of the attack. When the fever had been reduced in consequence of its absorption, I prolonged the interval to every two or three hours, according to the register of the thermometer. Aconite is a remedy "which," as Dr. Charles S. Wood once aptly said in a discussion before the Northwestern Medical and Surgical Society of New York City on the use of this remedy in the treatment of pneumonia, "should go hand in hand with the thermometer." When the child is less than three years old I use the smaller dose, which is increased proportionally with older ones. When the temperature is very high, as 105° or 106° , I have employed with benefit the mode of administration of the remedy so highly recommended by Sidney Ringer, of London,—that is, one drop of the medicine is given every fifteen minutes for one hour, thereafter hourly two or three times, after which the interval is prolonged, and its further administration is to be decided by the thermometric record. Concerning the *modus operandi* of the drug I shall not speak,

merely recalling the fact that it is classified as a cardiac sedative. Because of this depressing effect upon the heart, its use has been condemned by some able and celebrated physicians. I, however, have never had any bad results from its use. In the milder cases of the disease, and in cases occurring in robust patients, the system was enabled to tolerate the medication. In cases of an adynamic type, stimulating treatment was also very soon inaugurated, which *pari passu* helped to mitigate, if not to prevent, any deleterious effect of the remedy on the heart's action.

The reduction of the temperature was always quite speedy. Without entering upon a detailed history, I will quote from my case-book the daily temperatures of several cases.

	First Day.	Second Day.	Third Day.	Fourth Day.	Fifth Day.	Sixth Day.
CASE I.....	103°	101½°	101°	100°	98¾°	98½°
CASE II.....	102°	101½°	100°	98¾°	98½°	98½°
CASE III.....	103°	101°	100¼°	100°	99½°	98½°
CASE IV.....	101½°	100½°	100°	100°	100°	99½°

Many more could be cited to show the gradual daily decline of the fever under the use of the aconite in the doses mentioned, but I must forbear, lest the tedium of their recital should become wearisome.

When the phenic series of antipyretics were introduced, I abandoned the use of aconite, and employed the former in the treatment of scarlet fever. My experience both with dimethyloxyquinizine (antipyrin) and acetanilide were not so favorable as with aconite. True, the fever was diminished, but my cases did not appear to do so well generally. It seemed to me that the reduction of the fever was accomplished at the expense of the vitality and general well-being of the patient. My patients seemed to suffer more discomfort and prostration, while at the same time the respiratory centres seemed to be unfavorably affected, as evidenced by palpable signs of anxious dyspnœa. Cardiac syncope was also threatened in a number of cases. The doses were not large, averaging from two and a half to five grains. I am not prejudiced against these remedies, for it is my impression that I was the first physician in this country to use antipyrin for fever, and in

the first public report here in America on its action, which was made by me on October 15, 1884, before the Northwestern Medical and Surgical Society of New York City, I spoke very enthusiastically about it, though it was derided by the late Professor Austin Flint at that very meeting.* But for the reasons alluded to I soon forsook the treatment with these newer antipyretics, and resumed that with aconite. My later experience with this remedy only corroborated my former observations, and strengthened me in my belief that aconite was the best febrifuge to be employed in the treatment of scarlet fever.

With the hydropathic treatment of scarlet fever I have had no experience, since none of my cases have exhibited extreme hyperpyrexia, and the medicinal agents have always been able to reduce the temperature sufficiently in other cases. In the average case of the disease, however, I would hesitate very much before applying this method of treatment, because I think that other remedies are preferable. Only when the case had become desperate, and death from hyperpyrexia stared the patient in the face, could I be induced to resort to it.

During the recent epidemic of scarlet fever last winter and spring in New York City, of sixty-three cases of the disease treated by me with aconite, only three died, all of which were caused by severe cerebral complications, terminating fatally within the first three or four days of the attack.

When moderate hyperæmia of the throat exists, very little treatment is necessary, yet it is neither safe nor judicious ever to ignore even a mild angina. Small doses of chlorate of potash, from one-half grain to three grains, proportioned to the years of the child, either dissolved in water or placed dry on the tongue, will suffice. If the anginose condition be more severe, the addition of a few drops of the tincture of chloride of iron to the first-named medicine will be beneficial. If the pharyngeal inflammation be of a severer grade still, larger doses of the martial tincture should be given, even to the

* *New York Medical Record*, vol. xxviii. p. 364, and vol. xxix. p. 648.

extent of twenty drops per dose, in combination with the chlorate of potash.

The chlorate of potash must, however, always be used with circumspection in children, for they are much more susceptible to its toxic action than adults, lest, if too large doses be permitted, serious nephritic lesions may be produced. In my opinion a child should never receive more than three grains at a dose.

If follicular deposits appear in the crypts of the tonsils, I ordinarily prescribe the hyposulphite of soda, in doses varying from two to five grains, dissolved in a teaspoonful of some aromatic water. When extensive exudations of a diphtheritic character are present, I have been induced to use, because of the good results obtained with the remedy in the treatment of diphtheria and diphtheritic croup, the bichloride of mercury; and in the treatment of scarlatinal exudative angina, I must confess that equally satisfactory results have been obtained.

When these remedies seem tardy in their action in the cases in which the throat is severely involved, I have supplemented their use with local treatment, applied by means of the spray atomizer. For its solvent action I use trypsin in the presence of an alkaline solution, and for its disinfectant and deodorant effect, Lugol's solution in the atomizer, alternately. In all cases accompanied by fetor of the breath I use either the Lugol solution or a solution of carbolic acid as a spray for its correction, whether the case be mild or grave. The treatment of the exterior of the throat will be considered in another connection later in this paper.

In the course of any case, simple as well as severe, of scarlet fever, one must not be astonished to be suddenly confronted with any variety of complication, for the specific cause of the disease is of such virulence that the point of weakest resistance in the patient's organism will most likely be called upon to withstand its assaults. The most usual complications are acute nephritis with dropsical effusions and albuminuria, acute otitis media, and cervical adeno-cellulitis. I have named them in the order of frequency in which they have fallen under my observation.

In the treatment of the renal complication, which has

occurred in about six per cent. of my cases, I insist upon the observance of three cardinal principles,—namely, rest in bed, warmth of the surface of the body, and an unrestricted milk diet.

When the urinary excretion is diminished and œdema coexist, I administer a diuretic, preferably the acetate of potash, in the usual doses, combined with the tincture of digitalis. At the same time free catharsis is procured by the administration, at frequent intervals, of small doses of the solution of citrate of magnesia in younger children, and the compound jalap powder in combination with an additional quantity of calomel for older ones. When hæmaturia is present, which I have seen quite frequently, I have sometimes given, with benefit, gallic acid, in three-grain doses, repeated every three hours. At other times five drops of the colorless hydrastis in a teaspoonful of water every three hours has been efficacious to arrest the bleeding. I also order a daily counter-irritation of the region of the kidneys by means of sinapisms. When there is great general anasarca and abdominal ascites, threatening interference with respiration and circulation, in addition to the free purgative, hot vapor-baths are prescribed. These hot baths are applied in the following manner. The patient, stark naked, is laid upon a blanket, and immediately one or two bricks, which have been in the mean time thoroughly heated by immersion in pails of hot water, and then enveloped in flannel cloths, are placed both at either shoulder and at the feet, care being taken that they are not put too near the body, lest the patient be scorched. Another blanket is then thrown over the patient and the bricks. The upper corners of the superimposed blanket are brought over and tucked under the opposite shoulders, while the other end of that blanket, with the lower end of the underlying one, are lapped together under the heels of the patient, and the head alone is left to protrude from this improvised sack. The patient is retained in this hot pack for at least twenty minutes. It is resorted to once or twice daily, according to the urgency of the symptoms. Profuse diaphoresis directly occurs when the patient is submitted to this treatment, always resulting in a marvellous amelioration of the alarming and distressing symptoms ac-

companying dropsical effusions. The patients and their friends are apt to complain loudly of this heroic treatment, but I can recollect several instances where the child's life was saved from imminent death by it. This hot bath will often accomplish the end sought when all other measures have failed, and this knowledge is the justification for its employment, in spite of such protestations.

As an able adjunct to this diaphoretic treatment, pilocarpine muriate hypodermically and the fluid extract of jaborandi *per orem* have been employed by me.

The occurrence of symptoms expressive of uræmic intoxication demands the remedies appropriate thereto. The convulsions I treat preferably by means of rectal injections of chloral hydrate, of the strength of five grains to a drachm of water. This dose is thrown into the rectum every fifteen minutes until the convulsions shall have ceased. Coma I have always combated by speedy and active purgation, by the administration of a fraction of a drop of croton oil suspended in a blander oil, which is placed far back on the tongue. At the same time the patient is subjected to the vapor-bath previously described.

Finally, when the more acute symptoms of the renal complication have abated, I without delay put the patient upon some chalybeate preparation, which is to be continued for a considerable period of time. I always begin with the muriated tincture of iron, and later follow it with the compound citric acid preparations of iron with ammonia, quinine, or strychnia, according to the special indications of each individual case. Occasionally the patient will not tolerate the tincture of the chloride; then I substitute for it the acetic tincture of iron of the German Pharmacopœia, with better results. With this line of treatment I have lost but three cases of scarlatinal nephritis since I have been actively engaged in practice, which is a mortality of extremely low per cent. for that complication.

Though it be the opinion of many that a scarlatinal otitis will take care of itself, yet the numerous individuals with impaired hearing, traced back to an attack of scarlet fever, whom we meet, demonstrate how fallacious this view is. Even slight attacks of ear-disease occurring in the course of scarlet

fever must not be disregarded. The aural complications may be varied in nature and location. The most usual one, however, is an otitis media, either catarrhal or purulent, and occasionally diphtheritic. When tenderness and pain are complained of in the region of the ear, and symptoms of inflammation are developing, I make use of warm fomentations to the part, in the form of flannel cloths wrung out of either plain hot water or out of a decoction of either poppy-heads, chamomile, or hops. In the auditory canal a solution of warm salt-water is instilled, to which I have sometimes added a few drops of some opiate, or of a twenty-per-cent. solution of muriate of cocaine, the amount to be graduated to the acuteness of the pain. When the mastoid process of the temporal bone becomes involved, and is hot, tender, and swollen, I apply a leech to the part, which soon relieves the tension and congestion. If the pain should be referred to the tragus, the leech should be used there also. By filling the meatus with cotton, the leech cannot slip into the ear. If the patient have hæmophilic tendencies, the bleeding from the leech-bite may give rise to difficulty in its arrest. I met with such an example a few months ago, in which for nearly two hours I was unable to stop the flow of blood.

If by inspection in severe cases we can satisfy ourselves that the tympanum is projecting and is highly congested, presenting the appearance as though pus was accumulating behind it, the membrane should be incised, to liberate the imprisoned matter. This procedure will be followed by a great alleviation of the patient's symptoms. Even if no pus be present, but an intense hyperæmia only, *paracentesis tympani* should also be done, because by the release of the blood the patient's symptoms will greatly improve. When otorrhœa is profuse, whether of offensive odor or not, it is necessary to keep the auditory canal clean and free. In the simpler cases lukewarm saline solutions are indicated, and when fetor is present the addition of a disinfectant and deodorizer, such as boric acid, carbolic acid, Labarraque's solution, or permanganate of potash, in sufficient strength, should be added. I have used all of them at various times. This washing-out of the canal I advise to be done several times daily. After its com-

pletion the ear is gently wiped out with absorbent cotton, plain or medicated. Insufflation of the dry powders I do not use, because I think they would interfere with the free drainage and outflow of the discharges, and thus, perhaps, favor a possible extension of the inflammation to deeper structures, and even to the meninges.

After all acute symptoms have passed by I make use of astringent solutions to arrest the residual otorrhœa, usually a solution of the nitrate of silver of five or ten grains to the ounce of water. Of this solution a drachm is added to a pint of lukewarm water, the whole of which quantity is used at one sitting, and the operation is repeated three times daily. After the syringing has been done and the canal wiped dry, I instil in the ear three to five drops of sweet almond-oil, which has been gently warmed in the following way. A teaspoon is dipped in warm water; the drops of oil are poured into the spoon thus warmed, and from it let fall into the ear. I forbid the introduction of cotton pledgets into the ear, but at the same time caution strongly against the exposure of the affected side to direct currents of cold air. The course of treatment thus conducted has always given me the best results and the greatest satisfaction in the management of aural complications.

In the treatment of disease one can do too much oftener than too little. This reflection applies with great force to the treatment of cervical cellulitis-adenitis. When the laity observe the swelling and the œdema on the exterior of the neck, the temptation is to do a great deal and a great variety of things to relieve it. But what is the result? By their rude and energetic, though well-meant, manipulations, the inflamed structures are bruised and further irritated, the inflammatory action is increased, and the very result follows, in consequence of their active maltreatment, which they had hoped thereby to prevent, or at least to dissipate. When there is simple enlargement of the glands of the neck, with but moderate infiltration into the surrounding cellular tissue, I tell my patients to let it be, to do nothing, for nature will probably be able to cause absorption of the diseased products by the time that the attack of illness shall have run its course. Usually my prediction is verified. When the inflammation is of a severer

type, I prescribe an ointment composed of slightly carbolized lanoline or vaseline, which is to be gently stroked with the finger-tips, but *not rubbed*, over the swelled tissues. The ointment should be heated a little. I emphasize the injunction that it must not be rubbed, lest by such pressure irritation should be produced, which should be avoided. If, however, appearances indicate that absorption will not take place, and suppuration threatens, then I order hot flax-seed and slippery-elm poultices to encourage it. As soon as fluctuation is palpable a free incision should be made and the pus thoroughly evacuated. The resulting wound and cavity are then irrigated with a phenated solution of the strength of one to a thousand, after which the poultices are continued for a short period. When it is evident that suppuration has terminated, basilicon ointment, impregnated with a few grains of iodoform, is applied to the wound until it shall have healed. The disinfectant irrigations are also repeated at intervals until the final closure of the incision. It is interesting in this connection to refer to the case of a little girl, five years old, who came under my care with an attack of scarlet fever during April last. She suffered with a bilateral cervical adenitis. On the right side the œdema extended up over the angle and ramus of the jaw, over the cheek and molar bone to the upper eyelid, causing the eye to close. Much to my surprise, suppuration did not occur, but with the gentle treatment outlined above the exudation was by degrees entirely though slowly absorbed. On the other hand, on the opposite side, which was not so highly inflamed, the tissues took on suppurative action, requiring incision for its cure. Though this patient subsequently also developed nephritic and rheumatic complications, she is to-day entirely well, having successfully recovered from the entire train of dangerous lesions. Though it may be a digression, I cannot forbear at this juncture to speak of the most formidable case of cervical adeno-cellulitis which has ever come under my observation. The patient was seen by Dr. J. Lewis Smith and myself in consultation. He was between three and four years old, and had passed through several weeks of an attack of scarlet fever, during which time he had been treated by another physician. We found that he had had

an extensive cervical cellulitis on the right side, which had been accompanied by such profuse suppuration and deep ulceration and sloughing, that a cavity large enough to hold an egg had been excavated. At the bottom of the cavity the pulsating carotid artery lay exposed to our gaze, and its coats also were already quite deeply involved in the gangrenous process. We knew of nothing to hinder the fatal issue; ligation would have been a delusion and a snare. Early on the following day the vessel opened, and in a moment death claimed his own. I do not know whether a parallel case is on record, and its rarity has induced me to relate it at some length.

As already intimated, any form of complication may be expected in scarlet fever; among the less rare is acute articular rheumatism, for it is met with quite often. Its treatment does not vary at all from that suitable in cases of the regular idiopathic form of the disease. The salicylates have given the best results in my hands, especially when alternated with alkalies. The tendency of the rheumatism to involve the cardiac muscle and its sac in its embrace is not increased, because it assumes the rôle of a complication of scarlet fever. Certainly, one must be on the alert to forestall as far as possible any such trend of the rheumatic poison by watching the heart, and, on the slightest suspicion that such a contingency is to take place, treatment proper to oppose it must be at once inaugurated.

As regards the chorea, which not infrequently follows this combination of scarlet fever, rheumatism, and heart difficulty, I would state that I have followed up the treatment just alluded to with the administration of arsenic and iron for the choreic condition, and of the bromides, sometimes reinforced with chloral hydrate, to control the excessive nervous excitation.

The most formidable and most fatal complication of scarlet fever which we are called upon to face, is, in my opinion, acute cerebral meningitis, or encephalitis. The symptoms of this complication are in the majority of cases developed early in the course of the disease, and always with great intensity. The prognosis is always much more grave and unfavorable than when the cerebral affection is primary. Whether the aggressive character of the complication is due to a profound

saturation of the patient's system with the specific disease, entity of scarlet fever, or to this particular localization of inflammatory action in the course of the fever, I am not prepared to say. True, hyperpyrexia is commonly present in these cases, but I do not think the usually severe course and fatal result are to be attributed to this factor. Treatment of this complication is very unsatisfactory, and I regret to say almost always without avail. Iced applications to the head, the bromides, chloral, and opium in guarded doses, to control the congestion and restlessness, in conjunction with the routine treatment of the fever, constitute the measures which I have employed.

Several cases of acute pleurisy with effusion have also come under my notice as a complication of scarlet fever, independent of serous effusions attending renal disease. They terminated favorably, the effused liquid having been reabsorbed in consequence of a tonic treatment, aided by the exhibition of diuretics, mild cathartics, and counter-irritation to the chest.

I have had very few complications of the eye, indeed, and none at all of a serious character. In these mild cases the treatment was not modified in any way, but carried out as though the eye affection was a primary disease.

The vomiting, which is usually the initial symptom of scarlet fever, does not call for any special treatment, for it will cease spontaneously as soon as the stomach shall have been emptied of its contents. In a few cases anorexia persisted, but it was finally controlled with ice-pills, bismuth, and lacto-peptine, and carbonated drinks.

Diarrhoea is more apt to complicate the disease than constipation. In a number of cases I have witnessed an almost intractable dysentery, which required very energetic treatment before it was checked. I can recollect one case last winter in which the dysenteric discharges continued for nearly three weeks. In simple diarrhoea the milder astringents and corrigents, as chalk mixture, bismuth, acetate of lead, with pargoric, have always been efficacious. In the graver forms of dysentery, I have obtained the best results from the administration of the elixir of coto bark, in doses ranging from ten or twelve drops to half a drachm in a teaspoonful of water,

repeated hourly. When pain and tenesmus are prominent symptoms, I add to the coto from one-half to two drops of Squibb's liquor opii compositus, which is discontinued as soon as those symptoms have disappeared. The opium is given every two or three hours as the urgency of the symptoms indicate. If the patient betray any symptom of narcosis, or undue susceptibility to the action of opium, careful watching is necessary, and it must be abandoned before its dangerous effects should ensue.

For the constipation any of the milder cathartics will do, but what I have used with satisfaction are the suppositories of glycerin, which have been lately brought into use.

Whatever other complications, and to which I have not alluded, may occur, they must be treated in accordance with those principles which their symptoms and location may determine; for, as this paper is founded on my own experiences in the treatment of this disease, I have treated chiefly of those complications which actually fell under my care.

It yet remains to consider certain general principles of treatment applicable to the management of the disease. Isolation of the infected individual is the only prophylactic treatment of which I know. This quarantine must be an honest one, and must be maintained until the period of desquamation shall have been fully completed. The attendants are also to observe certain obvious restrictions as regards intercourse with the outside world, clothing, and other minutiae, with which we are all familiar. The sick-room must be properly and sufficiently ventilated, and not so hot as the patient's family are prone to have it for fear that the patient may "take cold." Scrupulous cleanliness about the body-linen and bed-clothing is to be strictly enjoined. The diet should be a liquid and easily-digestible one, suitable to the age and the condition of the patient. If the attack be a mild one, stimulation can be dispensed with; but when it threatens to be severe or prolonged, I do not wait until my patient is debilitated before resorting to stimulants, but I at once begin with them, in order to counteract any such tendencies, and continue their use, until convalescence has been firmly established. I employ alcohol, preferably in the form of whiskey or champagne, and

augment its action by the exhibition of digitalis and sparteine sulphate. These two last-named remedies I often combine in the same menstruum, allowing from two to five drops of the tincture of digitalis and from one-sixty-fourth to one-tenth grain of the sulphate of sparteine, for instance, in a drachm of camphor-water every three or four hours. Sometimes, when great prostration is imminent, I prescribe the aromatic spirits of ammonia, in addition to the other cardiac stimulants, in doses of from three to twelve drops in a teaspoonful of water, every fifteen minutes, until the patient shall have revived. In such cases the food is also administered in as concentrated a form as possible.

The ordinary disturbances of the nervous system dependent upon the presence of fever, the common antispasmodics, as the bromides and the like, will control.

To allay the itching of the skin I have at times employed inunctions of feebly-carbolized white vaseline. But it has often been a question with me whether it did not interfere with desquamation and retard the necessary activity of the skin. I have therefore often substituted for them, when desquamation began, a course of mildly antiseptic tepid baths, either carbolated or sublimated, which seemed to me to hasten the desquamative process, and to produce a healthier action of the skin.

When the eruption is faint or tardy in its appearance, or when it shows a tendency to fade away, in the vernacular "to strike in," I have resorted to warm baths, to which mustard has been added, and to the application of sinapisms to the various portions of the body which appear to be the palest; besides which, ammonia is administered internally. In the majority of cases the eruption then resumes its brilliancy.

The patient must be confined to the house, even in the very mildest type of scarlet fever, and must be protected against all exposure to the vicissitudes of the weather.

The general management of the patient, after having passed through the attack, will, from the nature of the case, consist mainly of tonic and sustaining measures, coupled with a proper observance of hygienic principles.

A PLEA FOR A GENERAL ADOPTION OF PERSONAL PROPHYLAXIS IN DIPHTHERIA.

BY A. CAILLÉ, M.D.,
New York.

THE general recognition and acceptance of the principles governing antiseptic wound-treatment has given a new stimulus to the study of disease-prophylaxis, the importance of which seems to me sufficient to make the theme one of interest, particularly to members of this Society; and it is the thorough conviction of the importance of *individual prophylaxis* which prompts me to invite your consideration and earnest criticism of the practical points involved, as expressed by the title of this paper.

Diphtheria, in its various phases, is one of the most dangerous maladies which the physician is daily called upon to combat, and one over which we have no positive methods of control, when we face it, after it has found a firm foothold. At the present state of our knowledge every so-called specific treatment for diphtheria is an illusion, and I believe the time has come when the profession is prepared to admit to the public that the best and only treatment of a case of diphtheria is entirely symptomatic.

Holding in mind these facts, and taking into consideration the high mortality from diphtheria, we can all agree that preventive measures against diphtheria are imperatively demanded.

By the cultivation and simplification of preventive measures we may in the future triumph over infectious diseases. It is in this direction that the medical profession will be powerful for good, and the intelligent physician will come to an understanding with himself as to his duty in preventing diphtheria when he can and treating it where he must.

The duty of guarding the public health against the inroads of disease in municipalities is intrusted to sanitary officials; and the isolation of the sick, the use of disinfectants, and the

general measures of the sanitary police are adapted to this effect.

For a number of years past the writer's experience has led him to believe that the municipal control of diphtheria in large cities is inadequate, and that in educating the mass of the people in the adoption of personal or individual prophylaxis more good can be accomplished than by the enforcement of sanitary laws alone.

Every person familiar with public matters in the city of New York will admit that for a number of years past good work has been done, in crowded quarters of the city, by the Board of Health, and that the Board has carried on a very effective warfare against the usual sanitary defects apt to be encountered in busy centres with a large permanent and floating population, and no one will doubt that lives have been saved, that suffering has been lessened, and that the health of the city has thus been promoted. The reconstruction of old and unhealthy abodes, the erection of tenements with airshafts, ventilators, and lighted rooms, the supervision of our water-supply and house drainage, the isolation of the sick, the disinfection of infected apartments and localities, the compulsory abatement of nuisances, and prevention of filth accumulations, etc., have brought about a better sanitary status in New York City within the last ten years than would obtain without the efforts of our Health Board.

Through the courtesy of Dr. J. S. Nagle, of the Board of Health, I am able to show you a list of deaths from diphtheria for the past fifteen years.

DEATHS FROM DIPHTHERIA, NEW YORK CITY.

1873.....	1151	1881.....	2249
1874.....	1665	1882.....	1525
1875.....	2329	1883.....	1009
1876.....	1750	1884.....	1090
1877.....	951	1885.....	1325
1878.....	1007	1886.....	1727
1879.....	671	1887.....	2167
1880.....	1390	1888.....	1914

You will notice, at the first glance, a steady decline in the figures from 1881 to 1887. Now, notwithstanding this decrease in the mortality from diphtheria, which appears more

marked when we take into consideration that in 1873 New York's population was 1,025,000, and that at present it is 1,500,000, we are painfully aware that the mortality from diphtheria is still very great. And how can it be otherwise? The power of our health authorities is limited, and it may never come to pass that we can compel people to keep their bodies, clothes, rooms, and surroundings clean, or compel them to destroy filthy carpeting and bedding, and to exclude from dingy and cramped apartments pet animals and birds, or that we can properly isolate all those sick with diphtheria or prevent parents from nursing their sick and attending to the well at the same time.

Owing to the peculiar nature of the diphtheritic poison, we cannot rely on its wholesale destruction or dilution any more than we can rely upon the municipal control of infectious wound-disease. A good surgeon will find it possible to secure aseptic healing of a wound in filthy and infected surroundings and localities by directing his efforts to the person and parts liable to be infected, and our endeavors to check and prevent diphtheria must of necessity lie in the same direction, although tempered with the full understanding that methods of occlusion, such as antiseptic surgical dressing, are not applicable to the usual sites for diphtheritic localization.

In recognizing the inadequacy of municipal control, we may well put the question, under the various circumstances and chances of infection in a large city, What can the individual do to protect himself, and those dependent upon him, from diphtheria?

A definite knowledge of the nature and exciting cause of an infectious disease enables us to direct our preventive measures intelligently.

Diphtheria is an infectious disease, which localizes itself in the most accessible mucons membrane of the naso-pharyngeal and upper respiratory tract. All modern authorities agree that it is beyond a doubt, primarily, a local disease, and that a hyperæmic and defective mucons membrane favors its localization. It is of prime importance to hold fast to this point, and to disregard entirely the misleading arguments of those, who, in failing to detect in a few cases on examination a prominent

local deposit, speak of diphtheria as a constitutional disease with secondary mucous membrane exudation.

The investigations of competent observers show us with reasonable certainty that diphtheria is due to the invasion of a micro-organism which provokes tissue necrosis and the formation of a ptomaine which enters the circulation and produces constitutional effects. This point also we must hold in mind, and although it would appear that, according to the investigations of Löffler, Oertel, Prudden, and many others, there may be some difference of opinion as to the precise micro-organism or organisms which play the pernicious rôle, still they all agree as to the corpuscular character of the poison. It is furthermore understood that, (1) a hyperæmic mucous membrane offers favorable conditions for the development of diphtheria; and (2) that different forms of micro-organisms, identical in appearance with those supposed to be pathogenic, are found in the naso-pharynx in individuals in good health, and thrive in naso-pharyngeal mucus.

Now, bearing this in mind, we shall certainly follow a rational course if, in attempting to prevent diphtheria, we direct our efforts towards keeping in a healthy condition the mucous membranes usually affected, and in avoiding the accumulation of catarrhal secretions.

These more or less theoretical considerations led the writer, some years ago, to experiment as to the feasibility of personal prophylaxis, with special reference to those individuals who are prone to contract diphtheria several times a year, without apparent exposure, and whose infection might be looked upon as an auto-infection, due to the continuous presence of the diphtheritic poison in carious teeth, tonsillar crypts, and inspissated mucus, etc., upon the mucous membrane of the nose, pharynx, tonsils, base of tongue, etc.

These experiments were reported to the New York Academy of Medicine January 19, 1888, and published in the *Medical Record*, February 18, 1888.

My investigations extended over a period of two years, and consisted, to be brief, in subjecting a number of children and adults, who had notoriously suffered from diphtheria frequently, to a preventive treatment, consisting of gargles and nasal in-

sufflation of harmless antiseptic solutions several times a day, a reduction of enlarged tonsils, and the proper treatment of carious teeth by a competent dentist.

About thirty individuals were originally included in these experiments, but in only ten cases did I succeed in carrying out the details of personal prophylaxis to my entire satisfaction, as far as obedience to my instructions were concerned.

Thus the communication quoted deals only with the results obtained in ten cases. All the other cases were dropped from the list and no results noted, owing to disinclination or lack of energy and perseverance on the part of the individual, or other circumstances beyond my control.

The result of the preventive measures employed may be summed up in a few words. The ten persons experimented upon, who had suffered repeated attacks of diphtheria prior to October 1, 1885, did not have diphtheria at any time from October 1, 1885, to December 1, 1887. For further details I must refer you to the original report.

I was decidedly impressed with the possible importance of this observation, and determined to test this matter still further, and also to induce others to experiment likewise.

During the past five years I have introduced this method into a number of families with children, and I am personally convinced that cases of diphtheritic infection have been prevented thereby.

I have abstained from presenting you with another table of cases, because it is difficult to keep up a perfect control for a sufficient length of time, and, furthermore, the mere production of statistics will not carry conviction as to the points raised.

Such experiments can and should be made by all who come in frequent contact with cases of diphtheria. The result can be estimated and will carry conviction one way or the other; and no amount of theoretical argument pro and con can establish or destroy the feasibility of the procedure.

After the publication of my report, I was pleased to note its favorable reception in certain quarters. Among other communications, I received one from Dr. Edson, of the Bureau of Contagious Diseases, drawing my attention to a paragraph

in the Health Board's instructions for disinfection, which was suggested by my paper, and which reads: "Persons in contact with patients sick with diphtheria should use disinfectant gargles under the direction of a physician." My attention was also drawn to an article in the *St. Petersburg Medical Weekly*, No. 37, 1887, by Johannsen, who advises that a weak solution of potassium permanganate should be dropped into the nostrils of children every night. He claims to have practised this method for some time, and is firmly convinced of its value.

During the course of my investigations, I have made a number of observations which corroborate many of the views expressed in this essay. As regards an injured mucous membrane being a predisposing factor in diphtheritic infection, I would state that I have known diphtheria to follow cauterization in the throat and nose with nitric or sulphuric acid, or the actual cautery especially, in persons liable to sore throat; and such cauterization was followed by fever, glandular swelling, and a pseudo-membranous deposit not to be distinguished from a diphtheritic membrane.

I have furthermore observed that persons afflicted with heart-disease and other forms of faulty circulation—in short, persons whose mucous membranes are frequently cyanotic and hyperæmic—are very apt to contract diphtheria. I particularly remember a girl afflicted with mitral stenosis and insufficiency, who was a frequent sufferer from diphtheritic sore throat, and who after systematic gargling and insufflation did not take sick with diphtheria in three years. In the early part of the year 1888 she was confined to bed for two months on account of heart-failure and pulmonary congestion, and, being too ill to pay the necessary attention to her nose and throat, the preventive treatment was abandoned for a time. In the fifth week of her confinement in bed, while her general condition was good and her temperature normal, she developed genuine diphtheria, and became quite ill for a week.

Any one who will make it a rule to inquire will find that in most cases nasal or naso-pharyngeal catarrh, filthy gums, and carious teeth had existed for some time prior to the diphtheritic onset. Scarlatina, measles, and pertussis are pre-

disposing factors to diphtheritic infection, owing to the congested condition of the mucous membranes in those diseases, and *preventive measures to the nose and throat are the most important factors in the treatment of such cases*; for it is a well-known fact that many children fall victims to diphtheria secondary to scarlatina, measles, or pertussis, although there may have been ample time to apply preventive measures before diphtheria was at all manifest.

Recent bacteriological investigations have shown more than twenty forms of bacteria in the naso-pharynx and buccal cavity of persons in ordinary good health; even the streptococcus, which is looked upon by Prudden as the true cause of diphtheritic inflammation and tissue necrosis, has been found in the mouths of persons exposed to diphtheria, but not actually sick. On the other hand, it has been shown that it is quite possible to sterilize or disinfect the naso-pharynx and mouth, and, if not really to destroy, at least to hinder the development of dangerous germs.

I here show you a list of substances which have been tested as to their antiseptic properties in the buccal cavity, their antiseptic power being expressed in figures.

TIME NECESSARY TO DEVITALIZE BACTERIA OF MOUTH AND NASOPHARYNX.

The results will be seen in the adjoined table. In the first column are given the antiseptics, and in the second the time of exposure necessary to a complete devitalization:

Salicylic acid.....	1-100	$\frac{1}{4}$ minute.
Benzoic acid.....	1-100	$\frac{1}{4}$ "
LISTERINE, PURE.....		$\frac{1}{4}$ to $\frac{1}{2}$ minute.
Salicylic acid.....	1-200	$\frac{1}{2}$ "
Benzoic acid.....	1-200	1 to 2 "
Bichloride of mercury.....	1-2500	$\frac{1}{2}$ to $\frac{3}{4}$ "
" " "	1-5000	2 to 5 minutes.
Eucalyptus.....	1-200	5 to 10 "
Peroxide of hydrogen, ten-per-cent. solution		10 to 15 "
Carbolic acid, one per cent.....		10 to 15 "
Oil of peppermint.....		10 to 15 "
Permanganate of potash.....	1-4000	over 15 "
Boracic acid.....	1-50	" 15 "
Oil of wintergreen.....		" 15 "

W. D. MILLER, A.B., PH.D., D.D.S., Berlin.

The substances which I have employed are watery solutions of salt, alum, boracic acid, soda chlorinata, potassium permanganate. I do not claim that an insufflation into the nose twice a day, and gargling and rinsing three times a day, will sterilize the parts, but I do claim that by such procedures putrescible matter is carried off, and its accumulation together with the development of disease-germs prevented. Finally, I would state that I have never known otitis to result from the insufflation of lukewarm, non-irritating solutions, especially if the mouth is kept open during the procedure.

The reduction of large tonsils can be done with the knife or cautery, and is neither difficult nor injurious. The removal of bad teeth in children, or the temporary preservation of children's carious teeth with an easily-applied cement, demands the service of a dentist.

After my first communication on personal prophylaxis, I was told by some of my professional friends that the measures advocated were good, but too troublesome to carry out, and therefore not practical.

To this I would simply reply that if parents, who love their children, are told by competent and earnest physicians that they may possibly prevent diphtheritic infection by keeping the teeth, mouth, and nose in good order, they will be thankful for such information, and faithfully carry out a treatment which involves so little actual labor. That the indolent, ignorant, and shiftless will take no interest in such matters is an argument not deserving of serious consideration.

In closing this plea for a general adoption of personal prophylaxis in diphtheria, I will quote a few words from Dr. J. L. Smith's article on diphtheria in the "*Cyclopædia of the Diseases of Children*," vol. i. p. 655. After referring at length to Dr. A. Jacobi's views regarding the relation of diphtheria to follicular tonsillitis, and his early and persistent advocacy of preventive measures, he says, "In a report to the New York Academy of Medicine, Dr. A. Caillé expressed the belief that he has prevented the recurrence of diphtheria in those who have suffered repeated attacks of it by prolonged daily antiseptic treatment of their exposed surfaces, which harbored the poison or constituted a nidus favorable for its lodgement

and propagation. These somewhat novel views of Drs. Jacobi and Caillé certainly require consideration and experimental testing."

I can only add that nothing would give me greater satisfaction than to see the suggestion of Dr. J. Lewis Smith, as to experimental testing, carried out by this Society and its members.

DISCUSSION.

DR. FRUITNIGHT said that the first case of the disease which appears in a family usually dies, because the parents were not familiar with the symptoms, nor with the oftentimes insidious character of the onset of the disease. He had instructed the mothers to always examine the children's throats every morning just as regularly as they make the children's toilets, in order to inform themselves whether any abnormal condition might be present. Of course the mothers are taught to distinguish the ordinary appearances of the throat in health. If there be any appearance of deviation from that standard, some simple measures are used to cure it; if more severe symptoms are apparent, the physician is summoned. In this way, I think, I have been able to effect something in the way of at least mitigation, if not prevention, of diphtheria.

DR. EARLE would be glad to get the physicians to do what Dr. Fruitnight wished the mothers to do.

THE NECESSITY OF PROLONGED REST AFTER SOME ATTACKS OF DIPHTHERIA.

BY CHARLES WARRINGTON EARLE, M.D.,

Chicago.

It is probable that a larger number of sudden and unexpected deaths take place after diphtheria than follows any other disease. And yet we are acquainted with medical men who do not believe it worth the while to isolate those sick with this malady, and think their responsibility ceases when the white spots commence to disappear in the throat. The following is a hypothetical case, but is there a gentleman present who has not seen one or more which corresponds with it?

A. B. C., aged six years, was taken with a mild attack of

diphtheria, which yielded easily to treatment in five days. The spots on the tonsils had nearly disappeared, and I discontinued my visits. Ten days after, I was hastily summoned, and, upon my arrival, found the child dead. The parents informed me that the little one had made an excellent recovery from the diphtheria, and, although somewhat weak and easily tired, had been playing around the house. "A short time before we summoned you we noticed that the little one was quite pale, and complained of a little pain around her heart. She perspired freely, however, and we thought nothing of the pallor; but her limbs began to get blue and her breath short, and so we sent for you."

Death certificate reads apoplexy or heart-disease.

Not all cases are as pronounced and sudden as the one narrated; but death comes. Sometimes we have premonitory symptoms, if we will note them, and if we will take any sort of notice, death may be averted in some cases. I have recently ordered a young woman to maintain the horizontal position for ten weeks, and during some of this time her heart was so irregular and weak that its pulsations could not be counted. I saw a case recently in consultation with my colleague, Professor Quine, simply to add my testimony to his, that the only safety to a young girl who had passed through a mild diphtheria was in bed. Her heart was slow and weak, and the extremities were a little subnormal as regards temperature. The people were amazed when I told them that the child should be kept in bed for at least four weeks, and possibly a longer period.

Two months ago I saw a case, in consultation, in one of our suburban towns (we have no suburbs now,—we have taken them all in). An adult had only a moderate pharyngeal diphtheria, but his lungs were involved, probably a catarrhal pneumonia (secondary). He was very weak, but his recovery could be looked for, although a long time must elapse before he could resume work as a bank clerk. His attending physician had given him excellent advice, but everybody was clamoring for a speedy cure. It is sometimes very difficult to make the people understand the necessity of carrying out details, particularly those which the profession have not grasped and fully realized. Notwithstanding that this young man was

kept in the lying position,—fed with food whose assimilation was made as easy as possible,—nourished by rectum and under his skin,—life maintained by general, cerebral, and cardiac tonics and diffusible stimulants,—notwithstanding all this, he died.

I cannot undertake to discuss the pathology of these cases. It was not my intention, even if I fully understood it. What I desired to do was to call attention to these cases, and to obtain the endorsement—the influence—of this Society, so that we can go before the great general profession and say that these cases need more than a goose-quill and sulphur treatment.

Personally, it seems to me that it is a muscular failure. We all notice the rapid and terrible emaciation in these cases,—the general muscular failure and weakness. The heart as a muscle, in my judgment, suffers in like manner. Whether there is a fatty degeneration I do not know, but the heart cannot do its work. We have in most cases symptoms which point to some form of paralysis. It may be in the throat, the soft palate, or an unusual muscular weakness. It may be in a very slow or a very rapid pulse, or in irregularity.

We should not neglect it. It means more than we have been accustomed to acknowledge,—at least more than the majority of the profession seem to acknowledge. In some families, where they are willing to go to the trouble, I am in the habit of keeping all diphtheritic patients in bed two or three weeks after all symptoms subside.

This may not be necessary, but it is safe. It is absolutely demanded, however, where symptoms of paralysis are present, and should be insisted upon till every sign denoting it has disappeared.

No definite time can be named when this precaution should cease. It may be four weeks, and it may be four months; and in a case to which I refer in another paper, it was one year, and demanded not only ordinary care and treatment but life in the country.

The indications for treatment in these cases are from first to last the recumbent posture,—not to be relinquished for any purpose; the best and most nutritious diet introduced in every

possible manner; the nerve tonics—strychnia and nux vomica and electricity—associated with general tonics and stimulants; but placed before everything else and insisted upon is the recumbent position.

DIAPHRAGMATIC HERNIA WITH OPERATION.

BY J. O'DWYER, M.D.,

New York.

THE history of the following case of diaphragmatic hernia was furnished by Dr. Lynde, the resident physician to the New York Foundling Hospital:

Eddie B., aged three and a half years, first seen November 20, 1888, at which time he was reported as having been sick four days. The symptoms were severe dyspnœa, marked prostration, temperature 105° , no movement from the bowels in two days. Physical examination showed flatness over posterior portion of left chest with absence of respiratory sounds. Moderate dulness anteriorly, with broncho-vesicular breathing at upper part. Resonance having a somewhat tympanitic quality about sixth intercostal space in axillary line. Heart displaced to the right with apex beat most distinct in the epigastrium. Dr. Lynde, feeling confident that the case was one of empyema, inserted a needle in three different places, with negative result. Eight days later, the bowels having been freely evacuated by cathartics, the temperature is recorded as normal with absence of dyspnœa; but the general condition remained poor, and no change in the physical signs. He was allowed to be up and about, but was fretful and irritable and had a habit of frequently holding his hands to his sides.

December 16. Another similar attack is noted, with high temperature and urgent dyspnœa.

From this until the 15th of January, 1889, when I first saw the case, there had been several attacks in which the temperature ranged from 102° to 106° , with extremely rapid, feeble pulse and urgent dyspnœa. During the worst of these attacks, which always coincided with constipation, the little

patient appeared to be in a dying condition, but a brisk cathartic always brought relief, until the day before I saw him, when no improvement followed a free evacuation.

When I examined the case there was flatness on percussion, with absence of breathing-sounds everywhere over the left chest, except in the region of the apex anteriorly, where there was a moderate degree of resonance, with feeble respiratory murmur. The circumference of the left side measured three-quarters of an inch more than the right, and the heart was in the position noted above. I had no hesitation in pronouncing it a case of empyema with very large effusion.

We therefore inserted a much larger needle than that used on the first occasion, with the intention of drawing off a portion of the fluid, in order to allow the lung to become partially re-expanded before opening the pleural cavity. Nothing being obtained with this, a long trocar of still larger calibre was inserted and the aspirator applied, with same result. The distal end of the instrument, which was pushed in a distance of two or three inches, could be moved freely in all directions, proving that it was in a large cavity and not in a solidified lung or neoplasm.

As the real condition was not suspected, we naturally concluded that the pus was too thick to run, and made an opening in the sixth intercostal space, between the axillary and mammary lines. Something having the appearance of intestine blocked up the wound, which was then enlarged, and the cavity explored with the finger. The patient gave a slight cough as I withdrew my finger and forced about six inches of the small intestine through the opening, which we found considerable difficulty in replacing. It was found necessary, for this purpose, to insert retractors above and below, and use considerable force in order to separate the ribs. The wound was closed and compress with bandage applied.

The question now came up as to the feasibility of returning the intestines to their proper place, and making an attempt to close the rent in the diaphragm.

As the pleural cavity was already opened and air admitted, it was concluded that another opening, lower down, and large enough to admit one or two fingers, in order to determine the

size and location of the rent, would not materially change the outlook for the patient.

Should it be found favorably situated, and not too large to offer a reasonable prospect of bringing the edges together, the external wound could be enlarged by removing a portion of the ninth and tenth ribs, which would give ample room to work in, as previously demonstrated on the cadaver.

The following day, January 16, assisted by Dr. W. P. Northrup and Dr. Lynde, I made an incision about two inches long in the tenth interspace, and found the aperture to be situated in the muscular portion of the diaphragm, about one inch and a half in diameter, the external margin reaching close to the ribs.

I then removed about three inches of the ninth and tenth ribs, and by drawing down the floating ribs, ample room to insert the whole hand, if necessary, was obtained. Considerable difficulty was experienced in replacing the intestines, owing to the small size of the peritoneal cavity, from retraction of the abdominal muscles. The cæcum and some of the omentum were the last parts reduced.

To prevent a return of the intestines while paring the edges of the wound and passing the sutures, two flat sponges, attached to holders, were found necessary. Strong braided silk was used for this purpose, and six sutures inserted. When the diaphragm was allowed to resume its position, after the completion of the operation, the pressure from below was so great that it bulged upward, so as to fill at least half the pleural cavity. The hernia being probably congenital, and the whole mass of intestine, with the exception of the descending colon, having occupied the chest so long, there was not sufficient room for them in the abdominal cavity.

An attempt was made to relieve the great strain on the sutures by packing in some antiseptic gauze and closing the external wound around it, but without avail.

Death occurred rather suddenly six hours after the operation, at the very time that he appeared to be doing well.

At the autopsy the edges of the wound in the diaphragm, as seen in the specimen (exhibiting specimen), were found somewhat separated, and in all probability the sutures would

have cut completely through in twenty-four hours, had the patient lived so long.

The left lung was extremely small, apparently undeveloped, and collapsed; but all parts of it still contained some air.

The mediastinum was crowded so far over that the right lung was very much compressed, and contained a deep indentation or mould of the heart.

No mesenteric attachment existed below the cœlic axis, the descending colon alone being normal in this respect.

There are several points of interest connected with this case. (1) the fact that the physical signs were identical with those of empyema; (2) the frequent high temperatures, for which there was no apparent cause except constipation; (3) the futility of operation in diaphragmatic hernia of long standing, in which such a large mass of the intestines occupy the pleural cavity; (4) that the point of election for operation is through the thorax in preference to laparotomy. The upward arching of the diaphragm, which is augmented by opening the peritoneal cavity, must render the latter procedure very difficult.

The removal of a portion of two ribs made such a large opening that the whole pleural cavity was illuminated, even to the apex. The contracted lung and the pulsations of the heart could be distinctly seen. The mediastinum was pushed so far to the right that the left pleural chamber appeared to be large enough to occupy the whole thorax.

Recent and especially incised wounds of the diaphragm, which are usually situated near the periphery, can be reached and sutured by a free opening in the tenth or eleventh intercostal space, the floating ribs being so movable that they can be easily separated to a considerable distance. This was demonstrated by a case operated on by Professor Postemski, of Bologna, on the 4th of last March.

The following abstract of the report of this case was taken from the *Medical News* of June 8, 1889:

"The patient was a boy, aged fourteen years, who received a stab-wound two centimetres long in the eleventh intercostal space, on the left side in the posterior axillary line. The omentum protruded from the wound to a length of five or six centimetres. Professor Postemski enlarged the wound by

twelve centimetres, and forced the eleventh and twelfth ribs widely apart, bringing into view a large part of the vault of the diaphragm, in which a wound one centimetre and a half was seen. The protruding omentum was tied and cut away, the stump being pushed back into the abdomen. The edges of the diaphragmatic wound were brought together with silk sutures passed through the whole thickness of the muscle. The pleural cavity, which contained clots of blood, was washed out, and the wound in the chest wall was closed with deep sutures, no drainage-tube being used. After the wound was closed emphysema of the whole left side of the chest, up to the neck, came on, but in less than a fortnight both pneumothorax and emphysema had disappeared. The patient was presented at the Roman Academy of Medicine three weeks after the operation, completely cured."

DISCUSSION.

DR. HOLT.—As bearing on the difficulty of diagnosis, I would cite the case of a man who came under my observation, on whom a chimney had fallen, and who, after the second or third day, presented symptoms and physical signs which were supposed to be pneumothorax. There was absence of respiratory murmur, tympanitic percussion resonance all over the left chest, with displacement of the heart and of the other viscera. The autopsy showed traumatic rupture of the diaphragm, with the colon and a large part of the small intestine in the thoracic cavity.

DR. VINEBERG.—In regard to the symptoms, I recall a case in which the temperature went up to 106° F. from constipation, and subsided after evacuation of the bowels.

ACUTE PERITONITIS FOLLOWING VULVO-VAGINAL CATARRH IN A GIRL SEVEN YEARS OLD, SIMULATING A PERFORATION OF THE APPENDIX: LAPAROTOMY: DEATH.

BY FRANCIS HUBER, M.D.,

New York.

IN view of the difficulties attending a correct diagnosis and the rarity of the complication at this early age, the following case is interesting and instructive:

The patient, a girl seven years of age, had been troubled with a vaginal discharge for a short time. She was an exceedingly anæmic child, and though frail, did not complain much. Usually constipated; appetite poor. The vulva was inflamed, and a few drops of pus about the urethral orifice; the vaginal flow greenish and quite abundant. The hymen was intact; no evidences of violence about the genitals. Close questioning failed to discover any cause for the vulvo-vaginal catarrh. Unfortunately, an examination of the discharge for the characteristic coccus was not made. For a few days the patient was treated at the office. Some soreness about the lower pelvic regions, together with general weakness, made her take to her bed. The following day, June 1, she vomited once, a little blood being mixed in with the contents of the stomach. A little soreness over the pubes present upon abdominal palpation. The pulse was good; no distinct pain; a little diarrhoea (though constipation was the rule); temperature (rectal) normal. The little one, at this visit was laughing and in excellent spirits, though very weak. At the evening visit, the picture had changed for the worse, and the patient was in collapse. This condition had set in a short time before. The temperature was now subnormal, pain in the right iliac fossa marked, with muscular rigidity of the same side of the abdomen; vomited a number of times. Taking into consideration the rather sudden onset, the collapse with subnormal temperature, and the pain in the right inguinal region, with the

attending digestive disturbance and the prior history of constipation, I was inclined to suspect a perforation of the appendix vermiformis. A few hours later Dr. Charles E. Denhard (June 1) saw the case, and took the same view. The following morning (June 2) difficulty in urinating, attributed to an existing pericystitis, was noted. The child had rallied from its collapsed condition, and was certainly improved; vomiting less. Professor A. Jacobi was called in consultation, and, for the reasons above referred to, confirmed the diagnosis. As the urine had not been passed since the preceding evening, it was drawn off, and found free from albumen. The vomiting soon reappeared, and quickly became greenish; tympanites set in and became more marked; abdomen generally more tender, pain more and more severe in spite of morphia. The pulse grew more frequent and weaker; general condition bad. The next day (Monday, June 3, 5 P.M.) Professor Wm. T. Bull was called in consultation. The diagnosis of acute general peritonitis, due probably to perforation, was endorsed. A laparotomy was advised, the dangers of the case being fully explained to the family. Temperature (rectal), 101; pulse, 150 and very weak; vomiting incessant, and not influenced by any of the numerous remedies resorted to.

Eight hours later (1 A.M., June 4) the parents finally consented to an operation, though they were informed the case was desperate, and the prospects of ultimate success were not very encouraging. Chloroform was cautiously and skilfully given by Dr. Denhard, and Dr. Bull opened the abdomen by a lateral incision over the colon. Considerable sero-purulent fluid was found in the peritoneal cavity; the intestines were distended with gas, congested, and here and there coated with lymph. The appendix was sought for, and found after some difficulty. It presented a perfectly normal appearance, and no fecal concretion or foreign body could be detected through its wall.

The right fallopian tube, however, with its fibrillated extremity was inflamed and thickened, and evidently had formed the channel by means of which the infecting process had gained entrance to the peritoneal cavity and thus gave rise to a train of symptoms simulating closely a perforation of the

appendix. The true character of the case was only revealed at the time of the operation. The abdomen was now washed out with hot water, the wound sewed up, and an antiseptic dressing applied. A rectal injection of hot water and brandy was then administered, and the patient put to bed, with the head low. The operation apparently did not add any further element of shock to the unfavorable condition of the child.

Twenty hours later death occurred from heart failure, the pain and vomiting persisting to the end.

F. Spaeth (*Münchener Medizinische Wochenschrift*, February 28, 1889) raises the interesting question whether, in children, there is danger of the specific inflammation extending from the vagina to the uterus and tubes. In general, the trouble is limited to the lower portion of the genital tract, although a few cases of pyosalpinx, of gonorrhœal origin, have been reported. Säger has met with an instance in a girl three and a half years old, who developed intense peritonitis in consequence of gonorrhœal infection. He believes that cases of pyosalpinx and old localized peritonitis in young virgins might possibly be referred to gonorrhœa contracted in childhood.

A. F. Currier, in an article on "Vulvo-Vaginitis in Children" (*Medical News*, July 6, 1889), says, "In adults, this disease not unfrequently extends to the uterus, the fallopian tubes, the ovaries, and the peritoneum, and may end fatally. I can find but one recorded case in which such an extension occurred in children; but it seems to me extremely probable that many of the deformed and undeveloped uteri, with which are associated so much dysmenorrhœa and anguish, sterility, and domestic unhappiness, are the legitimate consequence of vulvo-vaginitis in early life."

Some time ago I saw, through the courtesy of Dr. A. W. Newfield, a girl eleven years old, with an acute illness, whose chief complaint was intense pain in the right groin with difficulty in urinating, some vomiting, and tenderness with rigidity of the right side of the abdomen, the right thigh being flexed upon the abdomen.

The existence of a severe vaginal catarrh put us on our guard, and a vaginal examination revealed an absence of the hymen, and an inflamed and exquisitely tender ovary.

Hadfield (ARCHIVES OF PEDIATRICS, 1886, p. 64) reports a case resulting in peritonitis.

In the case presented, the rather sudden onset with the prior digestive disturbances in a patient generally constipated, with collapse, subnormal temperature, intense pains in the right iliac fossa, with rigid abdominal muscles on the same side, and the rapid occurrence of acute general peritonitis, certainly justified the diagnosis of perforative appendicitis with general peritonitis. The vulvo-vaginal catarrh, though severe, did not appear to me to enter at all into the etiology of the case. From the rarity of the complication at this early age, I failed to appreciate the importance of the vaginal inflammation as a possible factor, and also failed to interpret correctly the import of the pelvic soreness complained of early in the case. Though it was not possible to establish the source of the infection, the vulvo-vaginitis was probably gonorrhœal, for the process involved the urethral mucous membrane,—an extremely important diagnostic point.

In twenty-one cases occurring in girls between the ages of three and eleven years Spaeth found Neisser's coccus in fourteen, and in all of these the inflammatory process extended to the urethral mucous membrane. He gives it as his belief that all cases of vulvo-vaginal catarrh in children, in which the urethra is involved and the gonococcus of Neisser is present, specific infection has occurred.

DISCUSSION.

DR. CAILLÉ.—I have seen one case five months of age. The father had gonorrhœa. The infant had ophthalmitis and also vulvo-vaginal catarrh, and finally developed peritonitis, from which it died.

DR. KOPLIK.—Sänger, of Leipsic, traces the cases of pyosalpinx occurring in young girls to vulvo-vaginal catarrh of infancy. This would seem to explain some cases in adult life which we cannot explain in any other way.

TUBERCULOSIS OF THE TESTIS IN CHILDHOOD.

BY HENRY KOPLIK, M.D.,
New York.

TUBERCULOSIS of the testis during infancy and childhood, as a primary manifestation of tuberculosis, is a field but little explored. Isolated cases of this disease are found in our literature, and a paper which will attempt to collect such cases and literature is certainly timely.

The first case reported, which I shall refer to, we find in the clinic of Hennig. This case was described by Robert Bahrdt.

Patient, æt. three and three-quarters years; in the service of Professor Hennig, 1870. In July, 1869, a swelling in the right scrotum was noticed; this became red; the epididymis and testicle became swollen; an abscess formed in the anterior aspect of the testicle; this opened and left a hardness. The abscess, after discharging, closed and did not reopen. The child died of secondary tuberculosis of the cerebellum, a tubercle, the size of a cherry, being found in this organ.

R. Demme, in a report of the Jenner Children's Hospital, reviews a collection of nineteen hundred and thirty-two cases of tuberculosis. Of these, sixteen presented the first symptoms of tuberculosis in the epididymis. In eight hundred and twenty-three cases, in which the disease first localized itself in the bones and joints, five developed tuberculosis of the epididymis.

E. H. Monks records a case of an infant, aged five months, who at first had an enlargement of the right testicle; the enlargement was painful, the spermatic cord was thickened and contained some hard nodules. In the left ischio-rectal fossa there was a distinct fulness as if an abscess were forming. Though the conclusion was that an injury had caused both phenomena, there was no history of the same. The ischio-rectal swelling developed into an abscess from which

two drachms of pus were evacuated. The testicle continued to enlarge, the skin on the posterior aspect became red, but there was no discharge. Infant died three months after first observation; the testicle alone was examined. On section, the posterior part of the organ was found breaking down into abscess. There were nodules surrounded by testicular tissue; there were nodules in the cord. Dreschfeld, of Manchester, examined the testicle, and found embryonic tissue, detritus, giant-cells, and a few tubercle bacilli in the scrapings. He was of the opinion that scrofulosis (?) of the testicle was present and primary, and set up general tuberculosis.

P. E. Lannois is convinced that this disease is not so rare as is generally supposed. Giralde, according to this author, encountered it in the new-born infant. In one hundred and eighty-three autopsies of infants, Papavonie, Dufour, and Banier record tuberculosis of the testis only once.

Lloyd records a case of an infant three and a half years old; Prestat, an infant nine months; Dufour, eighteen months. Unhappily, the cases recorded by Lannois have not been followed up; they have only been seen in clinic.

CASE I.—Infant five months old; right testicle affected; no other organ affected; hereditary history.

CASE II.—Right testicle, infant seven months old.

CASE III.—Infant thirteen months old; left testicle; hereditary history.

In Case I. the father had a cough and night-sweats for months. In Cases II. and III. the father was also affected with a cough for a long period.

Gevaert asserts that tuberculosis is rare in the infant up to the sixth year of life. Gosselin and Walther also assert its rarity (Jacoud, "*Nouveau Dictionnaire de Médecine*," 1883, t. xxxv. p. 296); these cite a case three and a half years of age. Lloyd records a case at eighteen months; Dufour, at nine months; Prestat, in an infant at term (Giralde). A. Dupres has met the disease in infants from the age of six months to one year. Gevaert's case is an infant eighteen months; left testicle tubercular; scrotum distended to the size of a hen's egg; the skin over the tumor is stretched and thin; the tumor, superiorly, presented fluctuations; inferiorly it is round, hard,

and nodular. The various coats appear adherent to the testicle. The cord is swollen; the testicle is painful when squeezed. The lungs free. The child has suffered from pertussis for a month past. Castration performed; good recovery. Macroscopically there was still some healthy tissue in the inferior part of the affected organ. The superior portion was riddled with abscesses. In these there was a creamy pus.

Professor Lammelongue, in Verneuil's "Studies upon Tuberculosis," records the following cases:

CASE I.—Child, *æt.* two months; right testicle tubercular, with a fistula into the epididymis; an enlarged nodular moniliform cord. The enlargement occurred just after birth, and terminated in fistulous openings. The region of the prostate and seminal vesicles on the right side affected.

CASE II.—Double tuberculous testicle at the sixteenth month. Began by an affection of the right testicle at two months, the little patient having previously suffered from a subhyoid abscess. The right testicle enlarged and more affected than the epididymis. It is unequal, irregular, and fused with the head of the epididymis. It is difficult to define both organs. The epididymis is also irregular, hard, and changed. The cord is affected. The left testicle equally enlarged. The epididymis and testicle can both be made out. Cord and skin not affected. Mother tuberculous.

CASE III.—Infant ten months old; noticed a month after birth. The epididymis and testis form a tumor the size of an egg. The two organs fused into each other. Tumor is regular, but it can be separated into three lobes. There are fistular abscesses. The cord is enlarged.

Author's case.

Child, *æt.* twenty-two months; was first seen February 14, 1889. Mother is a healthy, well-built woman, of German extraction. She has two other children, both of whom are in good health. The father of the child died six months ago with symptoms pointing to pulmonary phthisis and disease of the bones of the spine. The mother says the child has enjoyed good health until eight months ago, when she first noticed a swelling in the calf of the left leg; this swelling broke open and discharged. It has been discharging ever

since. Two months subsequent to the appearance of the above, the testis on the left side began to grow larger in size, red, and a fistulous opening appeared at the summit of the swelling (anterior superior part of testis). This opening is still discharging pus. Seven weeks ago the little patient contracted whooping-cough, and has been coughing ever since. The convulsive seizures have ceased, but the cough persists. Child has for months suffered from a chronic diarrhœa. Has never had scarlet fever or measles.

Status.—The patient is somewhat anæmic, though well nourished; has an eczematous patch on the left side of the nose; the skin is otherwise free from eruption. The bones show signs of rhachitic processes, also the head. The lymphatic nodes at the back of the neck—also those under the jaw and in the inguinal groove—enlarged.

Heart, normal signs. The lungs show behind rather a tympanitic tone to the percussion; subcrepitant râles heard over both sides.

Abdomen.—Examination gives negative results. The testis of the left side enlarged to the size of a small hen's egg; skin red and fairly adherent; tumor is uniformly rounded, not painful except upon very extreme pressure. What may be taken for the epididymis can be felt behind; on opening anteriorly and superiorly discharges a yellow thick fluid. The spermatic cord is swollen below; not nodular. The lymphatic nodes along the cord are much enlarged. The testis on the right side is of normal size and appearance, but the lymphatics on the right groin are also enlarged. There is a suppurating tract in the calf of the left leg, behind, at the junction of the lower and middle third. This is not at present discharging, though the history of the same shows that it does so at intervals. It leads into a district of tissue thickened and uneven; it is not possible to positively connect it with the bone. The scrapings from the sinus in the testis show tubercle bacilli in sparing quantity.

February 18. The fibular abscess has now begun to discharge. The opening in the affected testis also discharging; there is a small fungoid growth of granulations at the opening in the testis, not mentioned above.

February 23. The testis was removed by Professor Weir at the New York Hospital. The enlarged and diseased testis, when removed, was fully the size of a large walnut; a section through the fungus showed the interior an irregularly round portion surrounded by thickened skin and coverings, while behind the epididymis was seen. That part corresponding to the testis proper, on section, was mottled yellowish in color, the cut surface was uneven, and bathed in a yellow creamy fluid. In portions white punctate areas were seen. At the posterior inferior part of the tumor was a cavity filled with the above cheesy or creamy material; this was located, as far as could be made out, in the region of the epididymis; this cavity did not communicate with the discharging sinus exteriorly. The sinus in the calf of the leg was thoroughly explored, but it did not communicate with the bone. Its origin, at the operation, was supposed to be traumatic. Patient obtained complete union of wound.

May 1. Return of disease.

In the lower part of the cicatrix of the operation-wound there has appeared at first an incrustation, then an ulcer, and finally a deep linear ulcerating area, stretching in the direction of the cicatrix. About this time a small lump was felt in the lower part of the scrotal sac, on the operated side. The patient has had during the suppuration of this ulcer night-sweats but no cough; there is no emaciation. The condition of the patient is much better than before operation. The cervical lymphatic nodes are still readily felt, but the inguinal nodes are very small, less large on the diseased than on the operated side. An examination of the lungs shows absolutely no disease. In addition to the ulcer in the cicatrix, the scrotal lump shows on its summit two yellowish spots. The examination per microscope will be given below. Scrapings from the ulcer showed tubercle bacilli.

Dr. W. W. Van Arsdale extirpated the return of the disease, and obtained complete union all along the operated area, with the exception of a small millet-sized spot, which remained granulating at the discharge of the patient.

Here we lost sight of our case, the parents having migrated to Germany. Before departure, the little patient was re-

examined. He was in very good physical condition, of good color, lungs perfectly free from signs other than normal. There was no cough or sweats; urine normal. Lymphatic nodes very small at the back of the neck; in the inguinal region, almost of normal size; smaller on the diseased side. The opposite side, both testicle and cord showed no signs of disease.

The microscopical examination of the removed testis divides itself into the appearances of the testis proper, the epididymis, the skin, and vas deferens.

The testis, on section, when hardened, had a uniform whitish appearance of cheesy consistence. In places, macroscopically, the tissue presented irregular openings, as if honeycombed; this appearance was caused by the shrinking action of the alcohol upon the softened cheesy areas. The mass of the testis showed under the microscope to be composed of small nodules or granula, aggregated together to form diffuse masses, taking up the greater bulk of the part assigned to the body of the testis. Some of these nodules were composed of small and large, round or polygonal, cells, which, when the section was shaken, were seen embedded in a net-work of fine reticulum of connective tissue. The central portion of most of these nodules (miliary in size) had undergone disintegration so that either only granules appeared or remains of nuclei. In the peripheral portions of some of these miliary areas, or tubercle granula, were situated two or more giant-cells. The central portion of some tubercle granula had simply a granular structure. The central zones stained a deeper violet with hæmatoxylin and eosin than the peripheral zones. The above describes what appeared as old miliary tubercle granula; those of recent eruption could be seen here and there scattered through the tumor mass. They consisted of a peripheral portion of concentrically arranged spindle- and polygonal-shaped cells; towards the centre were seen round and polygonal cells, in the midst of which were a number of large giant-cells. These apparently recent granula were very few in number, the whole mass of the testis being taken up by the great number of tubercle granula with cheesy centre or centre with detritus of disintegrated cells. The areas between these miliary granula or the masses of diffuse tubercle

were taken up by connective tissue or spindle- and spherical-shaped cells.

In one spot there was a portion of the original tissue of the testis to be seen; in this the seminiferous tubules were shown to be the seat of a curious change by which, when stained, the nuclei of the lining epithelium and the whole tube were stained in a diffuse manner, giving the structures a hyaline appearance. In other places only the centre of the lumen of the seminiferous tubercles had a hyaline appearance, whereas the nuclei of the lining epithelium showed fairly well. The interstitial connective tissue of the tubules was largely increased, obliterating and pressing upon the lumen of the tubules in places. There were few blood-vessels to be seen in the area taken up with tubercle granula, but outside this the blood-vessels, in places, appeared the seat of obliterating changes, or their walls were infiltrated with small round cells. In places where tubercle granula were absent, there was a large amount of connective tissue, fibrillar in structure, with spindle or round cells, with a fibrilla basement substance; this, apparently, did not differ from connective tissue seen in chronic interstitial changes of other organs.

The coverings of the body of the testis are seen, on section, to be agglutinated so that they cannot be differentiated. The skin proper, however, is not involved with any changes, except for the presence of infiltration of small round cells, especially in the vicinity of the blood-vessels and the discharging sinus fungus. Some of the smaller vessels in the deeper layer of the skin and tunica vaginalis are the seat of obliterating changes; the area in the vicinity of such vessels is infiltrated with small round cells.

The epididymis.—(a) The interstitial connective tissue between the walls of the tubules was markedly increased.

(b) The walls of the tubules in some places had undergone remarkable increase in thickness by the apparent growth of connective tissue; the lining epithelium, however, in some of these tubules remained still intact, and the lumen of the tubule was filled with simple granular detritus, or free from change, or filled with small epithelial cells spheroidal with round nuclei, apparently spheroidal, because here the staining did

not bring out the exact shape of these cells filling the lumen of the tubes, but in places where the tubes were not so fully packed with these cells, but only contained say six, their form was spheroidal with round nuclei.

(c) In other places there was a diffuse formation of tubercle. The tubules and tissue of the epididymis was replaced by tubercle granula, composed in the periphery of round and spindle-shaped cells; arranged concentrically in the centre of each granulum was either beginning disintegration of the cells spheroidal or round, leaving nuclei or portions of detritus, or there was detritus and round cells. Giant-cells were found either in the centre or the periphery, generally the latter in numerous instances.

(d) In this portion of the organ the most interesting change was found in one or two spots. This consisted of a single tubule replaced by a tubercle granulum, while the surrounding tubes showed slight changes. In such a structure, the most external part, could be seen one or two strands of connective tissue, apparently the remains of the wall of the tube within these spheroidal cells, while deeper was a zone of epithelioid cells with giant-cells; in this zone the cells were beginning to undergo hyaline changes; in the centre was detritus and loose nuclei. A photograph of this change is given.

(e) In this organ I found no changes corresponding to those described by some authors, who show pictures of centres of tubes or tubules; the detritus and cells and nuclei conform to a structure resembling giant-cells.

(f) Obliterating changes were here also found in the smaller blood-vessels.

Tubercle bacilli were found, first in the testis, in the tubercle tissue, in granula, in the periphery of the same, and in the centre in giant-cells, and in the connective tissue, and round-cell infiltration between the areas of diffuse tubercle. They were not found at all or in very spare numbers in cheesy areas.

In the epididymis they were present in the tubercular areas; but especially in those of the tubes, which are described above as apparently just replaced by one tubercle granulum.

The structures of the spermatic cord at the point of incision

were the seat of no change of distinctive character ; there was an infiltration of small round cells very distinct between the structures of the cord. The vas deferens showed no change ; the tissue, external to the same, showed an infiltration of round cells ; but in children I would hesitate before calling this abnormal. No tubercle bacilli were found.

The small piece of tissue excised from the return of the disease *in loco* showed that what had appeared as small yellowish granules on the skin surface were tubercle granula of recent formation ; they appeared in the very superficial layers of the skin replacing the same even to the epithelium surface. They were composed of round cells, or spheroidal cells ; at the centre they were beginning to disintegrate. Below these tubercle granula the smaller arteries showed obliterating changes of a tubercular character with hyaline degeneration of their walls. But especially interesting was a very recent eruption of miliary tubercles found in the deeper layers of subcutaneous connective tissue, which was excised also at the time with the above.

Tubercle bacilli were present in these growths in very large numbers in the tubercle granula, in the infiltrated adjacent tissue in the walls of the affected blood-vessels, and in portions of tissue apparently not yet invaded by disease.

Before going into detail, it is important to establish the fact that what many authors have called abscess in these tuberculous testes is not as we know abscess in the true sense, unless there has been a mixed infection. If such a softened area is cut into, the creamy yellowish fluid will be found to be devoid of any of the characters except its color of pus. It is made up of detritus, few nuclei, and we will be fortunate if we can establish bacilli, for in some of these cases the bacilli are not apt to respond to our tests.

In our case the tubercular process manifests itself by (a) diffuse formation of tubercle ; (b) recent miliary tubercles ; (c) interstitial changes accompanying the same ; (d) changes in the blood-vessels. In the epididymis we had found old and recent tubercle, (a) peculiar changes in the tubes, both in the walls and epithelium ; (b) interstitial changes, and finally changes in the blood-vessels.

In advanced processes, as was the case in our patient, it can scarcely be possible to state with certainty whether the testis or epididymis was primarily affected, the testis being in my case the seat of the greatest change, showing less recent formations than the epididymis.

Differential diagnosis.—In the diagnosis of this form of disease of the testis, I will only point out the importance of distinguishing between tuberculosis and syphilis. In the latter case, the disease is completely under the control of internal medication. Fournier, whose experience in this field seems to have been quite large, describes the form of testicular tumor in hereditary syphilis as identical with that of acquired syphilis. In his cases he has found this so. There is tumefaction with preservation of the ovoid form of the testis. This form is always retained. There may be general induration, or, more generally, partial sclerosis in areas. These plaques of hardness, or sclerosis, feeling as they do like grains of lead or dried peas, have been called nodules of Ricord. The vas deferens, seminal vesicles, and prostate remain intact. The termination of the malady, if left to nature, is a sclero-atrophy of the organ. I have carefully brought these notes of Fournier forward because, whenever a case of testicular trouble is presented, syphilis in the minds of some is the first and most natural diagnosis.

In none of Fournier's cases did breaking down or the so-called abscess or sinus result. It must therefore be exceptional. Then he lays stress upon the preservation of the ovoid (smooth) form of the original organ. Such a case I have had lately, in which a uniform ivory-like sclerosis of the left testis occurred, with slight enlargement and marked increase, also, in weight of the organ, in a child twelve months old, whom I had at a very early period treated for an eruption, which was diagnosticated as a papular syphilide. This testicular tumor became smaller, but retained its sclerotic consistence under specific treatment. In all the cases of tubercular testis thus far recorded in children there has been involvement of the skin, breaking down into what the authors have called abscess (?), and discharge externally, or, if this had not already existed, it was threatening. Then the tendency in

some reported cases to involve the prostate and other structures as the cord and vas deferens. An enlarged, irregular, nodular organ with discharging sinuses, enlarged cord, should make us think of tuberculosis.

In looking over the twelve cases which I have collected in this paper from the literature, we find that tuberculosis of the testis has been described as occurring in infants, from the second month to three years and nine months. The disease in some cases is mentioned as having been noticed immediately after birth. The right testis seems to have been the selected organ in the majority of cases. In most cases the tuberculosis of the testis or epididymis apparently was primary, and the first manifestation of the disease; in some cases it was followed by general infection; in others, there are no data as to this termination. In one case an isolated cerebral tubercular mass was found to have caused death, apparently having been formed after the clinical diagnosis of tubercular testis had been established. In four cases the spermatic cord was affected with the testis, and in one case the disease had spread to the prostate and seminal vesicles. It is to be especially noted that in no case could a traumatism be clearly established, and that most cases, especially those recorded by Lammelongue's studies, in Verneuil, had an hereditary history. The father, in most cases, was the victim of phthisis. In my own case this undoubtedly was the fact. The fact of this isolated occurrence of a tubercular organ, at a very tender age, as the first symptom of a tubercular infection, with an hereditary history, lends additional support to the theory of the intrauterine origin of most of these cases, the heredity of tuberculosis, the congenital tuberculosis in Baumgarten's sense.

It is not the pretence of this paper to attempt so ambitious a theme as the exact treatment of these cases in the face of such paucity of material; but certain it is that the operative indication appears to interfere very early in all these cases. Even where it is not possible to establish the presence of tubercle bacilli from the scrapings of a sinus, the patient is better protected by an early removal of the disease, for in many tubercular testis, for some unknown reason, it is not possible to establish the presence of these micro-organisms.

Delay through ineffective medicinal treatment does injustice to the little patients, for it seems that at the outset the disease is certainly purely local. If operation be resorted to, it should be thorough, for even in our case a distinguished operator was baffled by a return *in loco*, and I wish to point out that the local return occurred not only in the cicatrix, but, deep in the connective tissue of the scrotum, in the very midst of what to the naked eye was to all intents healthy tissue, a fresh eruption of miliary tubercle was found, and tubercle bacilli were found in the lymph spaces of the connective tissue.

In conclusion I desire to express my very sincere thanks to Professor Weir, of New York, and Dr. W. W. Van Arsdale, of New York, for the many courtesies in connection with the recorded case.

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A CONTRIBUTION TO THE STUDY OF THE SUMMER DIARRHŒAS OF INFANCY.

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(Continued from November Number.)

BELOW is a table derived from the tenth census, the deaths from diarrhœa, enteritis, dysentery, cholera morbus, and cholera infantum being classed together and contrasted with the total deaths:

		All Ages.	First Year.	Second Year.	Third Year.	Fourth Year.	Fifth Year.	Under Five Years.
Western Massachusetts...	Total.....	7,115	1,269	337	226	176	138	2,146
	Diarrhœal.....	431	261	49	20	3	2	336
Cities.....	Total.....	15,972	4,237	1,148	598	463	347	6,793
	Diarrhœal.....	1,451	924	213	32	16	9	1,195
Alabama, Group I.....	Total.....	1,034	190	53	32	28	13	316
	Diarrhœal.....	86	32	14	5	3	0	54
Arizona.....	Total.....	291	56	11	9	4	0	80
	Diarrhœal.....	12	3	2	1	0	0	6
Indian Population.....	Total.....	903	114	52	42	32	19	257
	Diarrhœal.....	48	5	10	8	5	3	31

These figures alone are perplexing, but if analyzed are capable of throwing some light on the subject. The infant mortality must be compared with some stable factor. The total deaths are of little value, the life and average age of the populations differing too widely. The total deaths from diarrhœa seem to offer a better comparison; but as almost all the deaths above infancy from diarrhœa belong really among the specific diseases, it is clear that a comparison with infant mortality could only furnish a rough index of wrong diagnoses. There thus remains nothing but the total infant mortality, the one usually chosen and fairly satisfactory. This comparison gives the following percentages: Western Massachusetts, 15.6; cities, 17.6; Alabama, Group I., 17; Arizona, 7.5; Indian population, 12.

These figures show nowhere near the difference between city and country mortality that should exist to justify characterizing the trouble as urban. They are not very accurate,—no such figures are,—but they are on too large a scale and from too diverse localities to be explained as accidental. It must be concluded, therefore, that summer diarrhœa, though tending to excel in the cities, is still a very common complaint in the country,—a conclusion which has always had its strong supporters. Dr. Farr's table, quoted by Curtis,* certainly shows a disproportionate increase of infant mortality with increase density of population; but this shows only general mortality in England, and is equally applicable to almost any disease.

It has always been a pet theory that heat is the cause of cholera infantum, and several pages would be required to cite the authors who have made this statement. Later efforts have been made to connect the trouble with humidity, pressure, rainfall, velocity of wind, ground temperature, and the jack-in-the-box ground water level. To be accepted as causes, they should be shown to vary with the morbidity and mortality in any place of moderate size. This has not and cannot be done. Baginsky,† by careful study in Berlin, has clearly

* Curtis, "Buck's Hygiene and Public Health," vol. ii.

† Baginsky, *Jahrb. f. Kinderheilkunde*, 1875.

proved that ground water, and ground temperature cannot be regarded as causes.

Seibert* has made so exhaustive a study of the relation of this disease to the weather, in New York, that it is only necessary to refer to his results. He has shown that the general morbidity curve runs up shortly after the curve of summer heat, but declines rapidly while the temperature is still practically unabated; that neither hot weather, moisture, pressure, rainfall, wind, nor water-supply vary with the disease. But Seibert also showed that the mortality rose as soon as the daily minimum of 60° F. was reached, thus more closely formulating Baginsky's statement that the disease is produced under the influence of continuous warmth.

While treating of heat, the theory of Meinert† requires mention. This author has strongly urged the theory that summer diarrhœa is really nothing but heat-stroke. His argument is hard to grasp, but seems to be based on the prevalence of the disease during hot spells, and the view that the diarrhœa is not sufficient to cause the general symptoms. Meinert uses the word "hitzschlag," but does not seem to distinguish between the two forms,—insolation, with coma and extreme hyperpyrexia, and simple heat-collapse without hyperpyrexia,—the first tending to result from exertion in a very hot sun, as shown by the experience of the British troops in India; the second occurring in any hot place, as the furnace-rooms of steamers, in previously debilitated patients. He would seem, however, to mean the latter form, heat-collapse.

In Germany heat-collapse may be a rare affection among children, but in America this can scarcely be said. Every physician has more or less cases manifestly due to the effects of heat, some tending towards true insolation and others to heat-collapse. The symptoms in these cases are variable; but diarrhœa does not constitute a leading symptom, embarrassed circulation prevailing.

* Seibert, *Medical Record*, 1888, vol. xxxiii. p. 307, and vol. xxxiv. p. 153.

† Meinert, "Sechzig Versammlung Deutscher Naturforscher u. Aertze in Wiesbaden;" *Centralb. f. Bakteriologie u. Parasitenkunde*, 1888, p. 567, and Bd. iii., 1888, p. 641.

Returning to summer diarrhoea, it is clear that if it is heat-stroke, the morbidity and mortality curve must run with the temperature,—a very hot day giving many cases, the same as with adults. This relation Baginsky did not find in Berlin, and is clearly disproved by Seibert's figures for New York. Very hot days are not of any necessity days of many cases of summer diarrhoea.

Lately figures have begun to appear, intended to prove crowding as a cause in common with heat. But crowding is a cause of mortality among all ages, and aggravates every sort of disease; it must therefore be regarded, not as a cause, but as a condition facilitating infection in a thousand ways, and also diminishing the system's power of resistance. In this connection Wiederhofer's* figures are worthy of note; in the Vienna asylum the brunt of the attack came in the first quarter in three out of five years, the worst months of each year being January, March, April, and July twice. The epidemics in the winter were associated with extreme crowding of the institution, owing to the desire to protect the children from the cold.

To sum up the conclusions reached as to the efficacy of the causes so far considered: Food, either manifestly bad and occasionally given, or approximately good and continually given, are not causes, but tend to induce, pave the way for, the disease. Crowding increases the mortality, as in every other disease. No climatic conditions show a close accord with the disease except a high minimum daily temperature, fixed by Siebert for New York at 60° F.; and even this is not sufficiently close to justify the assumption of being a direct cause.

This brings us to the last group of causes, the one lately urged from various stand-points by nearly every close observer who has written upon the subject. Eichorst,† Escherich,‡ Baginsky, Siebert, Wiederhofer, and a score of others have pronounced in favor of bacteria.

* Wiederhofer, Gerhard's *Jahrbuch der Kinderkrankheiten*.

† Eichorst, "Handbuch der speciellen Pathologie und Therapie," vol. iii. p. 172.

‡ Escherich, "Die Darmbakterien des Säuglings und ihre Beziehungen zur Physiologie der Verdauung," 1886.

Bacteria I believe to be at the bottom of the disease,—that is, rule bacteria out of all foods and the alimentary canal, and summer diarrhœa would cease to be. The writer's work has all been directed to elucidate this subject as offering the key to the causes, pathological processes, and let us hope treatment and surely prophylaxis. As the literature of the subject has, up to June, 1888, been recently reviewed, only a few facts will be briefly mentioned, my work given, and then an effort made to put the whole into a working form.

It is now well known that many forms of bacteria can not only pass through the stomach, but live in it, and Macfardyen* has shown that even the sensitive cholera spirillum will pass directly into the intestines, if given in water to a thirsty, fasting animal; to remain in an ordinary stomach the plant must be able to resist the effect of the gastric juices during digestion. This not a few can do, and Miller† has isolated several active fermenting kinds by which carbon dioxide, hydrogen gas, and organic acids—lactic, acetic, butyric—are produced from the stomach. As a whole, however, we have no accurate knowledge of the bacteria of the stomach; there may be certain constant forms, or they may change with the ingesta. Leo‡ has recently stated that plate cultures made from the stomach contents fifteen minutes after feeding contain many bacteria, while plates made an hour after feeding show few or no colonies.

A large number of forms have been isolated from the fæces of adults and infants, especially by Miller,† Brieger,§ Vignal,|| and Escherich;¶ but with few exceptions no author has been able to connect his forms with those described by others. This is due to the general difficulty of determining species from books, experienced in the whole province of

* Macfardyen, *Jour. of Anat. and Physiol.*, 1887, vol. xxi. pp. 227 and 413.

† Miller, *Deutsch. Med. Wochensch.*, 1884, p. 781; 1885, p. 843; 1886, p. 117.

‡ *Berlin Med. Wochensch.*, 1888, p. 981.

§ *Zeitschrift. f. Physiol. Chem.*, 1884, p. 306.

|| Vignal, *Archiv. de Physiol.*, 1887, p. 492.

¶ Escherich, "Die Darmbakterien des Säuglings und ihre Beziehungen zur Physiologie der Verdauung," 1886.

natural history, enhanced by the peculiarly insufficient descriptions given of most bacteria.

Escherich's work, however, though it has not greatly advanced our knowledge of bacteria in the intestine from a systemic point, has given us some data of great value, and placed the whole question in a new light. This author has shown that the bacterial flora varies with the food,—a mixed flora in the meconium, a definite one with milk food,—that is, there is a regular flora for milk-fed infants. This is characterized by the great predominance of two species, one predominating in the upper part of the intestines, and the other in the lower part. The first, his bacillus lactis *aërogenes*, is a facultative anaërobic species, capable of fermenting milk-sugar into acetic acid, hydrogen gas, marsh gas, and carbon dioxide being given off. The second bacillus, living in the lower part of the intestines, has a fermentative action, producing alcohol and a trace of acetic acid, and also has a powerful action on proteids and fats. Besides these two regular forms, Escherich has described several others of more or less common occurrence. This set flora, contrary to the confusion that might be expected, is due to the rigid requirements of the case. To flourish in the upper part of the intestines the plant must be able to live with little oxygen, to withstand the effects of the digestive fluids, be able to live on the chyme as found there, and have no pathogenic powers under the conditions given by healthy digestion. These conditions are quite far-reaching, and limit the properties of the plants very closely, especially as milk, though a good universal medium to sustain life, is not adapted to full development of many species. The sugars are represented by a rather permanent kind, the fats are slow to decompose, and casein, as shown by Escherich, is a decidedly resistant form to the decomposers of proteids.

In the lower part of the bowels little of the milk is left in the breast-fed, and the forms living there must depend chiefly on the secretions and excretions of the bowels. It is not improbable that Brieger's bacillus in the lower parts depends upon the mucus for its support. In children fed with cow's milk the bacilli have the advantage of a good supply of casein.

Once given the bacillus lactis *aërogenes* and Brieger's bacillus

in the intestines, every other form which might happen to slip in would have not only to fulfil the conditions made by normal digestion, but also to struggle with species already established.

With these forms in the intestine, any variation in the conditions—that is, change of food or changed secretions or excretions from the digestive tract—might render it possible for them to develop pathogenic qualities. Thus Baginsky advances the theory that the lactic acid form may thus run riot, and produce sufficient changes in the food to cause intestinal trouble, and even by excess of acid kill itself. This will be referred to later.

The knowledge of a set normal bacterial flora renders it possible to study the flora or floræ of disease with a fair hope of finding pathogenic forms, if such there be. By isolating all the forms possible, if any specific forms exist, they should be found regularly occurring, and by experimenting on animals similar troubles might fairly be expected to result. Fairly, since young animals offer much the same conditions as infants, and in normal life suffer from summer diarrhœa. Any one who tries to bring up kittens by hand during the summer is liable to see their pets die just like the children.

So far as known, but very little work has been done in this line. Escherich has noted an increase of the spirillum forms in the cases of watery diarrhœa, but holds them to be a result, not a cause.

Lesage* has described a most bizarre form of plant, which, he claims, produces the green color in the stools, is easily grown, and kills animals, with green diarrhœa, however introduced, as the specific form. This it certainly is not; no such forms regularly occur in the stools; in fact, nobody else has since been able to find it.

Booker† has isolated the bacteria from sixteen cases of summer complaint (used in my sense of the word), and found eighteen species, which he has lettered. Without entering into their biological characters, which are unfortunately not

* Lesage, *Archiv. de Physiol.*, 1888, p. 212.

† Booker, *Translations of the International Medical Congress*, Ninth Session, 1887, vol. iii. p. 598.

sufficiently given, the relation of the species to the cases and the results of his experiments on animals require note.

Bacillus A, found in five out of seven cases of cholera infantum. Milk cultures, one to six weeks old, fed to three mice and three young guinea-pigs, caused death in from one to eight days. One mouse had diarrhœa. Autopsy.—Nothing found except emaciation and Bacillus A in the organs, and as almost pure cultures in intestines; more or less drowsiness produced in the animals: kittens not susceptible. Eighteen-day bouillon cultures, sterilized, injected into jugular vein of three rats: all died. Nothing found at autopsy, unless possible congestion of vessels on posterior part of brain. Unsterilized fresh cultures produced no effect.

Bacillus B, found in ten cases, showed decided pathogenic properties. Milk cultures fed to three mice produced death in from two to four days; nothing found at autopsy except B in the organs and intestines. A mouse, young kittens, and young guinea-pig gave no results; cutaneous inoculation produced death, with autopsy resembling malignant œdema.

Bacillus D, found three times. Milk cultures fed to four mice and one kitten; one mouse died; nothing found except emaciation and plant in intestines. Cultures administered under the skin killed two mice and two guinea-pigs. Autopsy revealed only local inflammation and plant in organs.

Bacillus F, found in one case.

Melted gelatin cultures, administered subcutaneously, killed two mice. Autopsy showed only many bacilli at point of inoculation. Bouillon cultures failed. In ear-vein of rabbit, no result. Feeding four mice and one kitten gave no result; after croton oil and feeding, two mice died. Autopsy only showed plant in intestine.

The other forms are but briefly described, and no pathogenic properties mentioned.

In looking over the results of this work it appears that no constant form was found, hence no specific plant; that several of the forms when fed to animals were followed by death, in one exceptional case by diarrhœa. No pathological changes were found, but the plants were found in the organs. This result is very perplexing, and, like Booker, the writer is una-

ble to draw any conclusions from them; they do not seem to have any close connection with summer diarrhœa. The results of the various forms of inoculation seem to point to pure septicæmia as defined by Koch. That pathogenic forms were found is not remarkable, since both *bacillus lactis aërogenes* and Brieger's bacillus, under like conditions, cause death with massive lesions of the intestines.

Lastly, Baginsky* describes a dissolving form as constant in summer diarrhœa. His description is of the briefest, but gives certain peculiar characters which render it possible to affirm that Booker did not find it in his eighteen cases, nor the writer in his, with one possible exception. It is therefore clear that this is not a specific form. No experiments on animals are given.

My own experiments and work have been conducted on much of the same lines as those of Booker,—that is, as many forms as possible were isolated from the fæces of infants sick with summer diarrhœa, and a few cases of adult diarrhœa for the sake of comparison; also the results from some of my experiments on animals are included. My experiments on animals have been confined to subcutaneous injections in guinea-pigs to assist in determining the species of bacteria and feeding experiments on cats.

All the species isolated have been worked out on a common schedule and together, so as to allow actual comparison under the same conditions. With few exceptions it has been impossible to connect the forms found with those described by other authors. My cultures were derived from the freshly-passed fæces, not from the rectum; no material was attainable where this could be done, and so a certain amount of contamination doubtless occurred. But since bacteria take time to grow, and the material for planting was taken from the inner parts, not the surface of the fæces, the proportion of foreign bacteria must have been very small,—so small as to render it doubtful if one was found.

The portions of fæces used were mixed with distilled water steamed for an hour on three successive days. From this a

* Baginsky, *Deutsch. Med. Wochensch.*, 1888, No. 20.

second dilution was made and various quantities sown in gelatin. Glass dishes, covered by a glass slab, were used for the plate cultures instead of the old glass slabs, as being less liable to contamination, and doing away with the complicated ice-dish and level. In these the colonies were studied, and any distinct forms planted in gelatin tubes, and from these new plates made to insure pure cultures. Besides a certain number of colonies, easily distinguished on the plates, there was in most cases a large remaining number of small spheres in the gelatin, pin-head growths on the surface, and small white blotches, of about the volume of the pin-head spots, but flatter. These could not be distinguished one from another by any gross or microscopic study; but deeming it improbable that all were one form, eight or ten test-tubes were inoculated from as many colonies, in the hope of later finding distinctions. Each set of plates was treated in the same way, and all the test-tube cultures made kept until all the cases had been examined. This gave me some two hundred cultures, which were then carried through on potato in test-tubes, on agar-agar, and form and motion noted. They were then divided into species, any constant difference being accepted as proof of a species, and a type of each species being selected, the rest were discarded. With these types other biological characters were studied, as recorded below. Of the thirty-two tentative species two proved to be identical, giving me thirty-one species in all.

Contrary to Macfardyen's experience and my own expectation, a large number of plates kept in hydrogen failed to develop any species not found in those exposed to the air. Being very laborious and impossible for a large series, the method was later given up. At this time neither my method nor the pyrogalic acid method were known.

(To be continued.)

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